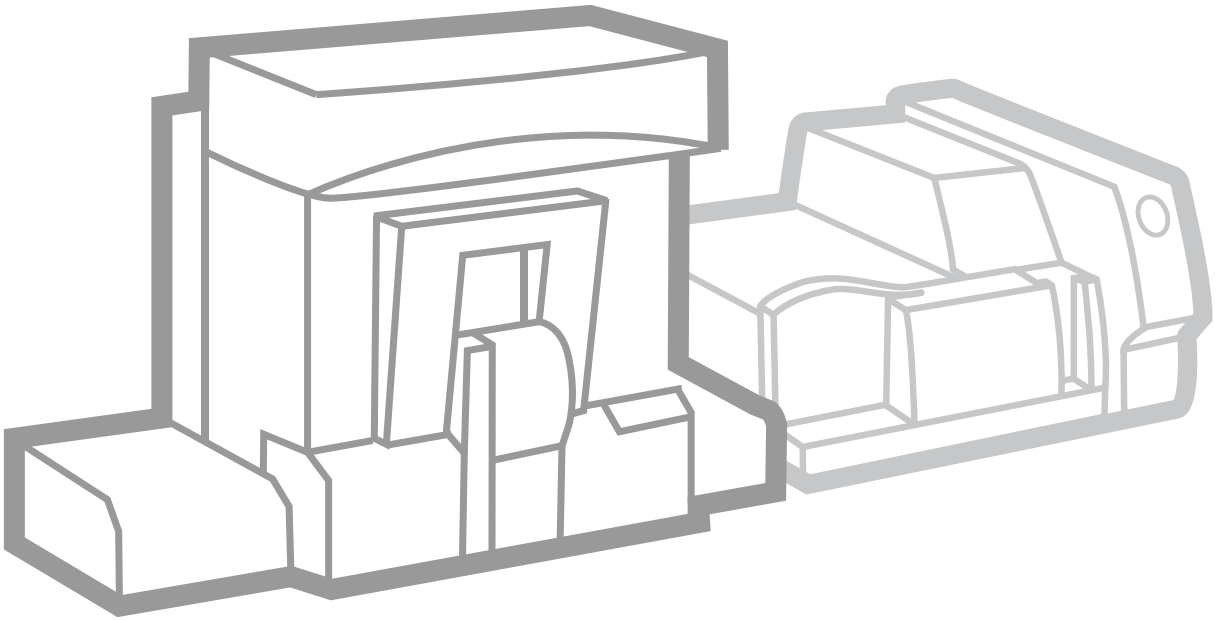
ADVIA® 2120
ADVIA® 2120i
Hematology Systems

ADVIA® 2120 / 2120i Hematology Systems

Operator's Guide



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SIEMENS

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Contents

CONTENTS **I**

WELCOME TO THE ADVIA® 2120 HEMATOLOGY SYSTEM **1-1**

OVERVIEW 1-2
COMPONENTS 1-3
HOW THE ADVIA 2120 HEMATOLOGY SYSTEM WORKS 1-14
HOW THE ADVIA 2120 SOFTWARE WORKS 1-15
RESULTS 1-18
SPECIFICATIONS 1-19

TURNING THE SYSTEM ON / OFF **2-1**

OVERVIEW 2-2
TURNING THE SYSTEM ON 2-2
TURNING THE SYSTEM OFF 2-4

DAILY ROUTINE **3-1**

STARTING EACH SHIFT 3-2
PROCESSING THE SAMPLES 3-5
ENDING EACH SHIFT 3-10

MAINTAINING THE ANALYZER **4-1**

SCHEDULE 4-2
SYSTEM WASH 4-3
CLEANING THE CENTERING COLLAR 4-3
CLEANING THE SHEAR VALVE AND ASPIRATION PATHWAYS IN THE UFC 4-7
CLEANING THE SHEAR VALVE 4-7
INSPECTING AND CLEANING THE SYRINGE PLUNGERS 4-10
REPLACING THE SAMPLER NEEDLES 4-12
REPLACING THE SHEATH FILTERS 4-15
REPLACING THE 50 OR 1000-µL SYRINGE PLUNGERS 4-16
CLEANING THE AIR-CIRCULATION FILTER 4-19
INSPECT THE PEROX-CAP VENT HOLE FOR BUILDUP 4-20
CLEANING THE AUTOSAMPLER ASPIRATE ASSEMBLY 4-20

TROUBLESHOOTING THE ANALYZER **5-1**

ALIGNMENTS AND ADJUSTMENTS 5-2
CLEANING PROCEDURES 5-5
REPAIR AND REPLACEMENT 5-24
TROUBLESHOOTING TIPS 5-45

FLAGS **6-1**

MORPHOLOGY FLAGS 6-3
SAMPLE/SYSTEM FLAGS 6-21

STATUS-LINE MESSAGES **7-1**

METHODS **8-1**

BASOPHIL / LOBULARITY METHOD 8-3
CSF METHOD 8-16
HEMOGLOBIN METHOD 8-21

PEROXIDASE METHOD 8-25
RBC / PLATELET METHOD 8-37
RETICULOCYTE METHOD 8-58

REGULATORY INFORMATION 9-1

METHODS INTRODUCTION 9-4
NCCLS GUIDELINE (GP2-A) AND BAYER METHOD TOPICS CROSS REFERENCE 9-18
CBC METHOD 9-21
CSF METHOD 9-33
WBC DIFF METHOD 9-45
RETICULOCYTE METHOD 9-54
METHOD DATA SUMMARY 9-62

ADVIA AUTOSLIDE® SLIDE MAKER STAINER 10-1

OVERVIEW 10-2
AUTOSLIDE SAFETY INFORMATION AND WARNINGS 10-5
THEORY OF OPERATION 10-8
AUTOSLIDE DAILY ROUTINE 10-9
AUTOSLIDE OPERATION 10-10
LOADING REAGENTS 10-10
LOADING SLIDE RACKS 10-11
LOADING SLIDES 10-11
EMPTYING THE STAIN WASTE CONTAINER 10-11
RUNNING THE DAILY STARTUP MANUALLY 10-12
ORDERING A SLIDE MANUALLY 10-12
STAINING MANUALLY SMEARED SLIDES 10-12
RESETTING THE AUTOSLIDE MODULE 10-13
STOPPING THE AUTOSLIDE MODULE (FAST STOP) 10-13
RUNNING THE DAILY SHUTDOWN MANUALLY 10-13
DISCONNECTING AN AUTOSLIDE 90° CONFIGURATION 10-14
AUTOSLIDE METHODS 10-18
PERIODIC MAINTENANCE 10-32
ERROR MESSAGES AND SUGGESTED ACTIONS 10-42
AUTOSLIDE SPECIFICATIONS 10-47

LEGAL INFORMATION A-1

LIMITED INSTRUMENT WARRANTY AND SERVICE DELIVERY POLICY A-2
WARRANTY AND SERVICE EXCLUSIONS A-4
CONTACT INFORMATION A-5
SIEMENS AUTORIZED REPRESENTATIVE A-5

WARNINGS AND SAFETY INFORMATION B-1

WARNINGS B-2
SAFETY INFORMATION B-3
REGULATORY COMPLIANCE B-3
DOCUMENTATION B-4
SYSTEM SYMBOLS B-4
INTERPRETATION OF RESULTS B-9
EXPLANATION OF THE WARNING LABELS ON THE AC POWER BOX B-10
EXPLANATION OF THE WARNING LABELS ON THE MANUAL CLOSED-TUBE SAMPLER B-11
PROTECTING YOURSELF FROM LASERS B-12

Welcome to the ADVIA® 2120/2120i Hematology System

OVERVIEW **2**

COMPONENTS **3**

AUTOSAMPLER 4
MANUAL CLOSED- AND OPEN-TUBE SAMPLERS 5
UNIFIED FLUIDS CIRCUIT (UFC) 5
OPTICAL ASSEMBLIES 7
SAMPLE, SHEATH, AND DIAPHRAGM PUMPS 10
REAGENTS, SHEATH / RINSE, WASH, AND DEFOAMER 11
VACUUM AND PRESSURE REGULATOR KNOBS 11
TOUCHPAD 11
TOUCHSCREEN 12
MANUAL BARCODE READER 12
WASTE REMOVAL SYSTEM 12

HOW THE ADVIA 2120/2120I HEMATOLOGY SYSTEM WORKS **13**

HOW THE ADVIA 2120/2120I SOFTWARE WORKS **14**

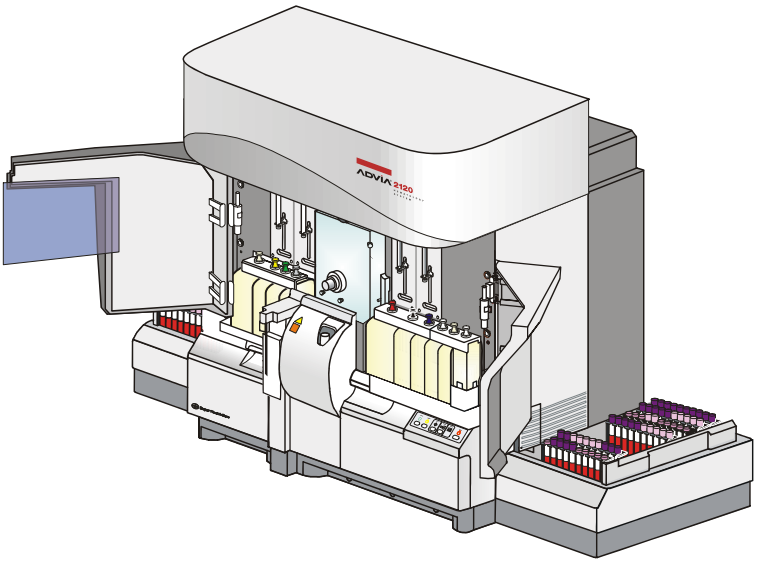
STATUS LINES 14
MENUS 15
TABS 16
LEFT-SIDE BUTTONS 16
MAIN DISPLAY AREA 16
BOTTOM BUTTONS 16
HELP BUTTON 16
SHORTCUT KEYS 16
WIZARDS 16
PRINTING THE SCREEN 16

RESULTS **17**

SPECIFICATIONS **18**

AUTOSAMPLER 18
DATA MANAGEMENT 18
PARAMETERS 19
PERFORMANCE SPECIFICATIONS 20
PERSONAL COMPUTER SPECIFICATIONS (MINIMUM) 20
PHYSICAL SPECIFICATIONS 21
SAMPLE MODE VOLUMES 22
TEST SELECTIVITY / THROUGHPUT 22

Overview



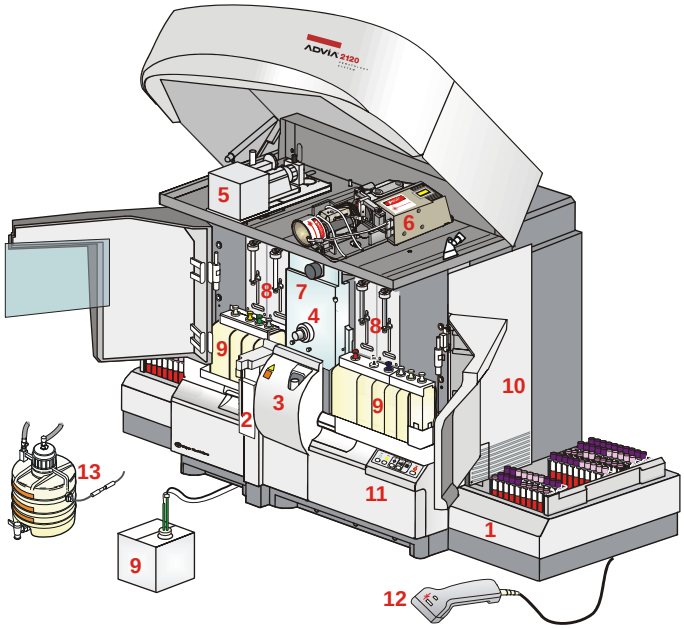
The ADVIA® 2120/2120i Hematology System is a fully automated diagnostic instrument with a throughput of 120 samples per hour (CBC/diff). The analyzer uses whole blood samples to provide the following types of results:

- Complete blood counts (CBC)
- CBC plus white cell differential counts (CBC/diff)
- Reticulocyte absolute, percent and indices counts (retic)
- CBC/diff plus retic (CBC/diff/retic)
- CBC/retic

Components

The ADVIA 2120/2120i Hematology System is made up of two major components:

- The analyzer contains all the electronics, pneumatics, hydraulics, and sampler mechanisms, as well as the on-board reagent storage for all reagents, DEFOAMER, and wash solutions except SHEATH / RINSE. The waste system is a subcomponent of the analyzer.



1 Autosampler

2 Manual open-tube sampler

3 Manual closed-tube sampler

4 Unifluidics™ technology

5 Perox optical assembly

6 RBC optical assembly

7 Hgb colorimeter assembly

8 Sample, sheath, and diaphragm pumps

9 Reagents, sheath, wash, and rinse

10 Vacuum and pressure regulator knobs

11 Touchpad

12 Manual barcode reader

13 Waste removal system

- The personal computer includes a monitor, a mouse, a keyboard, and the interconnect cabling.

Autosampler

The autosampler automatically transports, mixes, identifies, and aspirates samples in closed tubes.

The autosampler is a rack-style sampler with a capacity of 150 sample tubes: 15 racks of 10 tubes. The individual racks are barcoded for rack and position numbers.

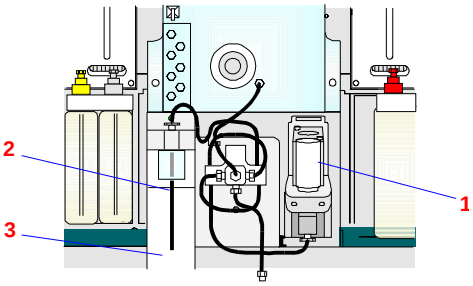
Allowable tube sizes

Tube size (mm) diameter x height	Manufacturer	Draw Vol. (mL)	Minimum Vol. Required Dead Vol. (mL)
10 x 50	Becton-Dickinson VACUTAINER	--	0.6
10 x 64	Venoject	--	0.6
11 x 65	Sarstedt Monovette	2.7	1.0
11 x 74	Tapval	4	1.1
11 x 78	screw cap	4	1.2
11 x 83	Sarstedt Monovette	4	1.0
11 x 91	Sarstedt Monovette	5	1.0
12 x 75.6	Greiner Vacuette	2, 4	1.0
12 x 80	screw cap	--	1.1
12 x 80.7	Exetainer	3	1.0
13 x 100	Becton-Dickinson HEMOGARD	7	0.8
13 x 100	Greiner Vacuette	6	
13 x 74	Monoject	5	0.6
13 x 74	Complexon	5	0.8
13 x 75	Becton-Dickinson HEMOGARD	2, 3, 5	0.8
13 x 75	Becton-Dickinson VACUTAINER	7	0.6
13 x 75	Becton-Dickinson VACUTAINER	5	0.6
13 x 75	Lip-Vac	4	
13 x 78	Venoject II	5	1.5

Some of the allowable tube closure types

- Standard VACUTAINER
- HEMOGARD
- Center puncture Safety-Monovette
- Venoject II

Manual Closed- and Open-tube Samplers



Single samples and STAT samples are aspirated from the manual samplers.

In closed-tube aspiration, the capped vial is inserted upside down into the centering collar (**1**). The downward pressure of inserting the tube into the centering collar will cause the needle to push up, puncture the tube closure, and aspirate a sample.

In open-tube aspiration, the sample probe (**2**) is immersed into the specimen. Pressing the push-to-aspirate plate (**3**) starts the sampling.

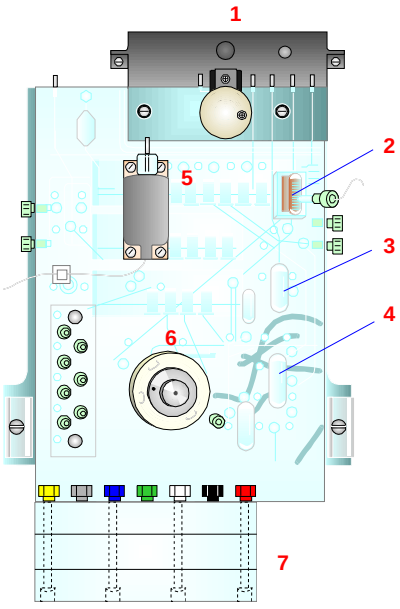
Sample identification and the type of test requested is entered by the manual barcode reader or from the Manual Sample ID tab before starting sample aspiration.

Unified Fluids Circuit (UFC)

The UFC assembly uses Unifluidics™ technology.

The UFC block is made up of eight acrylic plates. Machined within these plates are the pathways for the fluids and air flow, valves, and four reaction chambers. The perox reaction chamber is mounted on the outside surface of the UFC block.

The reagent pump assembly, mounted to the bottom of the UFC block, is also acrylic. The pump has one membrane with seven individual pump areas that act as diaphragms that force the reagents into the reaction chambers.



1 Hgb Reaction Chamber (Not Visible)

2 Baso Reaction Chamber

3 RBC Reaction Chamber

4 Retic Reaction Chamber

5 Perox Reaction Chamber

6 Shear Valve

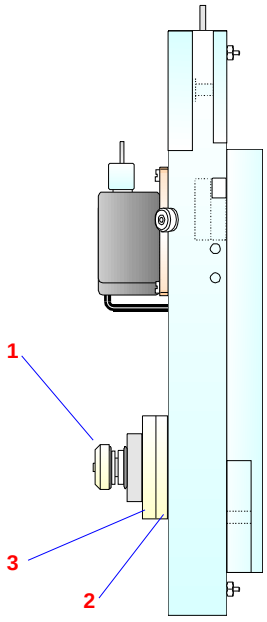
7 Reagent Pump Assembly

Shear valve

The shear valve (**1**) is made up of two ceramic disks. The rear disk (**2**) is stationary. The front disk (**3**) rotates to “shear” or divide the sample into appropriate aliquots for analysis.

The front disk also rotates to allow aspiration for direct cytometry.

(side view of the UFC)



Reaction chambers

The reaction chambers are machined pockets in the UFC assembly where the sample and reagents are mixed and the cytochemical reaction takes place.

There are five reaction chambers.

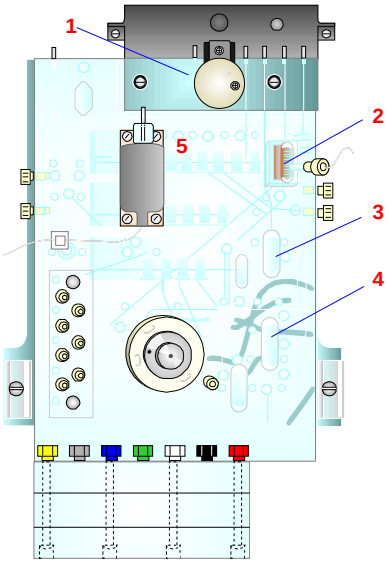
1 Hgb Reaction Chamber (Not Visible)

2 Baso Reaction Chamber

3 RBC Reaction Chamber

4 Retic Reaction Chamber

5 Perox Reaction Chamber



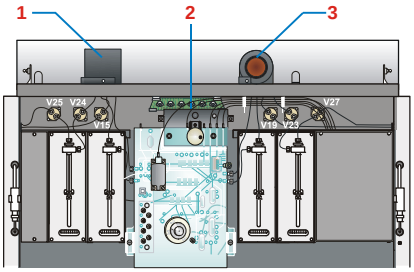
The perox reaction chamber (**5**) is temperature controlled. The mixture of sample and three reagents, PEROX 1, PEROX 2, and PEROX 3, is heated to achieve the desired cytochemical reaction.

The baso/lobularity reaction chamber (**2**) is temperature controlled. The mixture of sample and reagent is heated to achieve the desired cytochemical reaction.

The Hgb reaction chamber (**1**) serves as an optical cuvette in which the hemoglobin measurement is read.

The RBC/Plt and retic reaction chambers (**3**) and (**4**) serve as containers in which the reagents and samples are mixed for the desired cytochemical reaction.

Optical Assemblies



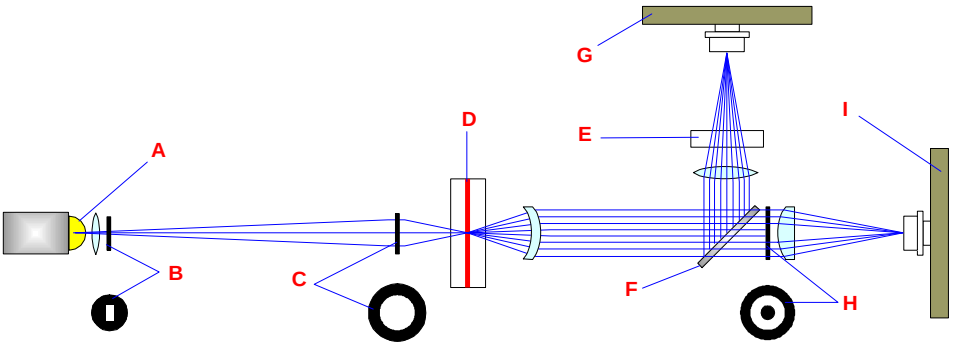
The perox optical assembly (**1**) directs light from a tungsten-halogen lamp to the perox flowcell. The use of a sheath stream in the flowcell allows a cell-by-cell measurement of light scatter and absorption.

The hemoglobin colorimeter assembly (**2**) takes voltage readings that correspond to the amount of transmitted light that passes through the reaction chamber. The system uses the readings to derive the hemoglobin concentration.

The laser optical assembly (**3**) uses a laser diode light source. This optical assembly is shared by the RBC/Plt, retic, and baso/lobularity channels. The use of a sheath stream in the flowcell allows cell-by-cell measurement of low- and high-angle light scattering and absorption.

Perox Optical Assembly

The perox optical assembly measures scattering and absorption of a tungsten light beam as it passes through a stream of prepared white blood cells in a flowcell.



A Tungsten Lamp

B Slit Aperture

C Circular Aperture

D Sample Stream

E Filter

F Beam Splitter

G Absorption PC Board

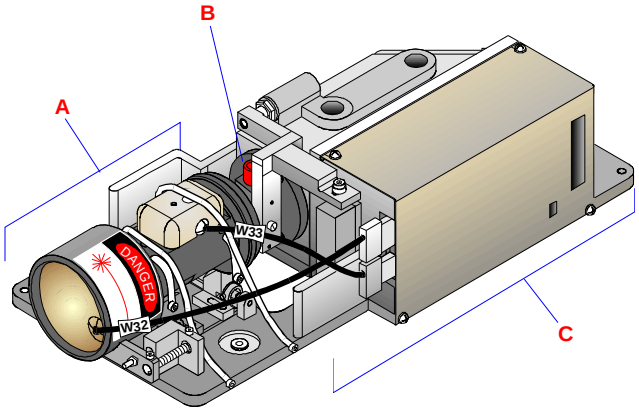
H Dark Field Stop

I Scatter PC Board

1. The image of a rectangular slit illuminated by the light from the tungsten lamp is focused into the flowcell and onto the photodiodes on the scatter and absorption PC boards. The detected signal pulses from cells passing through the slit image are proportional to the optical power scattered into defined angles and the optical power absorbed or lost. The resulting scattering and absorption of the light from each white blood cell is due to the size and staining characteristics of each cell.

2. The dark field stop intersecting the light beam going to the scatter photodiode only accepts light scattered at angles between 5° and 10°.
3. The absorption signals are collected over a 0° and 10° angular interval.
4. The photodiode converts the optical scatter and absorption signals from each white blood cell into two signal currents for each of the two channels (scatter and absorption). Preamplifiers convert these optical signals into signal voltages.

Laser Optical Assembly



A Illuminator Assembly

B Flowcell Location

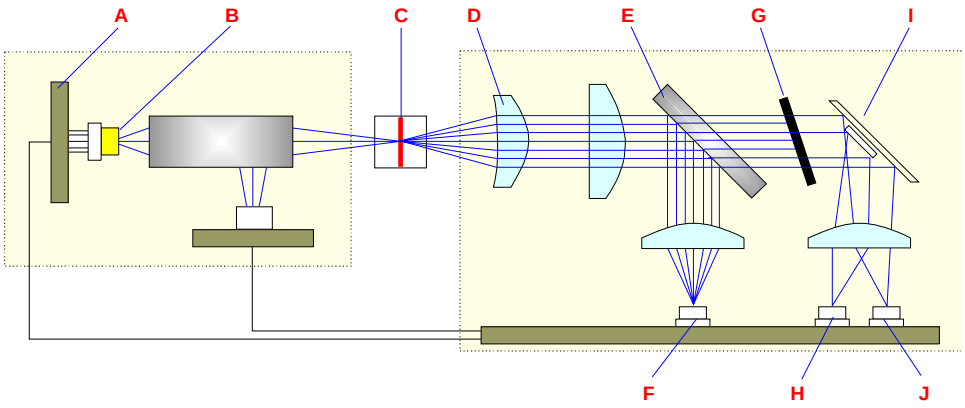
C Detection Assembly

The laser optical assembly consists of the illuminator, flowcell, and detector assemblies. A laser diode, housed in the illuminator assembly, is used as the light source.

The image of a slit illuminated by light from the laser diode is focused into the flowcell. The sample/sheath stream in the flowcell contains iso-volumetrically sphered red blood cells (RBC).

The RBCs and reticulocytes that pass through the slit image in the flowcell scatter light at low and high angles; the stained reticulocytes also absorb a percentage of the light. The scattered light is detected by the two scatter photodiodes and generates the following signals:

- A high-angle scatter signal corresponding to light scattered at angles between 5° and 15°
- A low-angle scatter signal corresponding to light scattered at angles between 2° and 3°



A Laser Diode Driver Board

B Laser Diode

C Sample Stream

D Hi-NA Lens

E Beam Splitter

F Absorption Detector

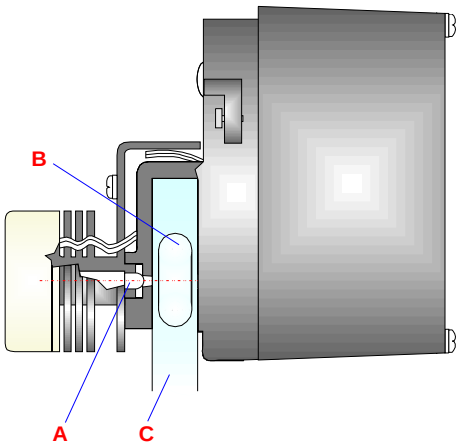
G Asymetrical Dark Stop

H Low Angle Scatter Detector

I Beam Divider

J High Angle Scatter Detector

Hemoglobin Colorimeter Assembly



A Lamp Assembly **B** Hgb Reaction Chamber **C** UFC Assembly

The hemoglobin colorimeter assembly straddles the UFC block (**C**) at the top.

The colorimeter contains a light source (**A**) set at 3.5 Vdc and a 565 nm or 546 nm interference filter, according to the HGB method selected.

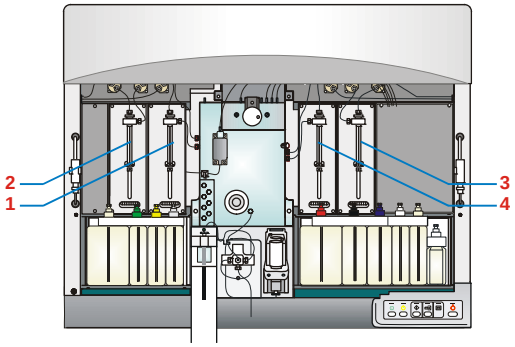
The hemoglobin reaction chamber (**B**) is built into the UFC assembly.

Hemoglobin concentration is calculated using baseline and sample readings taken at specific intervals during the hemoglobin sample analysis period.

These voltage readings correspond to the amount of transmitted light that passes through the reaction chamber when it contains sample mixed with reagent or rinse.

The voltage readings are then converted to a digital form by the Hgb Interface Board and sent to the analyzer CPU to calculate the optical density and derive the Hgb concentration.

Sample, Sheath, and Diaphragm Pumps



The perox sample (**1**) and sheath (**2**) pumps are located on the left side of the analyzer.

The RBC/baso/retic sample (**3**) and sheath (**4**) pumps are located on the right side of the analyzer.

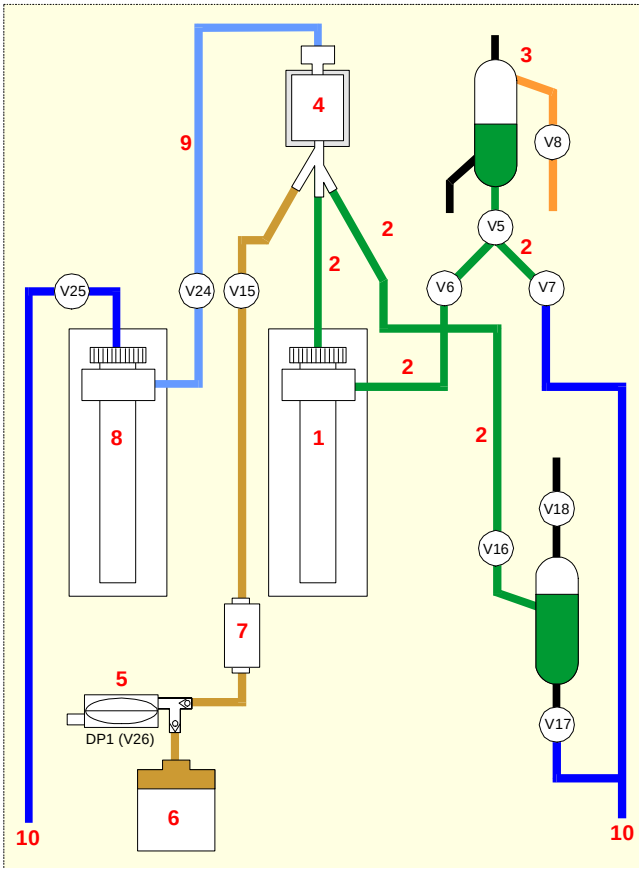
The diaphragm pumps for sheath, rinse, and wash (five in all) are located above the reagent containers.

The sample pumps (**1**) dispense an exact amount of reacted sample (**2**) from the appropriate reaction chamber (**3**) into the flowcells (**4**).

The sheath diaphragm pumps (**5**) push the sheath (**6**) through the sheath filters (**7**) directly into the flowcells.

The sheath pumps (**8**) pull the PEROX SHEATH or SHEATH / RINSE and the reacted sample stream (**9**) through the flowcells for analysis.

The analyzed sample and sheath are sent to waste (**10**) and the lines, flowcells, and reaction chambers are washed and rinsed.



Reagents, SHEATH / RINSE, Wash, and DEFOAMER

Reagent is mixed with a sample for cytochemical analysis and measurement.

Sheath is a fluid that envelops the sample stream as it passes through the optics, ensuring cell-by-cell analysis.

Rinse cleans the hydraulic pathways and reaction chambers after each sample to prevent carryover and ensure the integrity of the results.

Wash solution removes buildup in the hydraulic pathways. A system wash should be performed periodically: once a day or after a set number of samples.

DEFOAMER reduces foam buildup in the waste container.

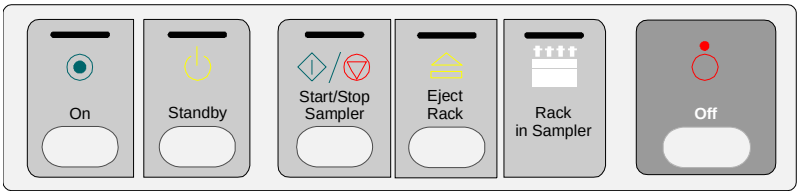
Wash, PEROX SHEATH, DEFOAMER, and all cytochemical reagents are located on the analyzer and, except for the SHEATH / RINSE and DEFOAMER, they are monitored on a cycle-by-cycle basis.

The SHEATH / RINSE is in a CUBITAINER® placed on the floor.

Vacuum and Pressure Regulator Knobs



Touchpad



The touchpad, located on the lower right of the analyzer, is the means by which you operate the analyzer.

On – Provides power to the analyzer assemblies and power supplies. After **On** is pressed, samples through the manual open- and closed-tube samplers can be processed within 2.5 minutes, while samples through the autosampler can begin processing within four minutes.

Standby – Sets the analyzer to a lower power state. To exit, press **Standby**.

Start/Stop Sampler – Starts the autosampler operation from the Ready to Run mode or stops the autosampler. When the autosampler operation is stopped, samples underway are allowed to finish.

Eject Rack – Moves all racks within the autosampler into the output queue. The analysis of the last sample aspirated is completed.

Rack in Sampler – Lights up when a sample rack is in the autosampler, including the input queue.

Off – Turns off the power to all analyzer assemblies and power supplies, except the touchpad.

Touchscreen

The touchscreen monitor makes it possible for you to perform your daily tasks directly at the monitor without using the keyboard.

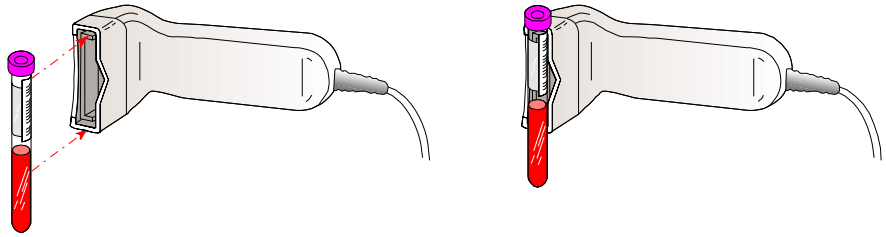
On the touchscreen monitor, you can do the following:

- Use your finger, with or without gloves, to select all window controls, including function buttons and operations in the online Help.
- Move a window by holding your finger on the title bar of the window, drag the window to the new location.

NOTE: The touchscreen may not responds correctly if your finger or gloves are wet.

You can clean the touchscreen monitor using a lint free paper towel dampened with 5% bleach solution. Dry the screen and your hands throroughly.

Manual Barcode reader

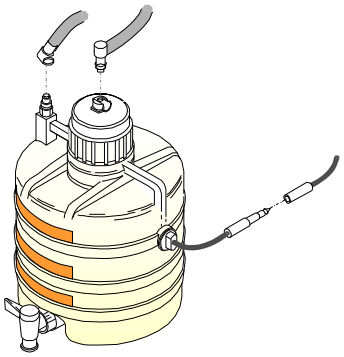


The manual barcode reader is used to enter information from labels on sample tubes, reagent containers, controls, and calibrators. As each label is correctly read, the LED on the wand will blink.

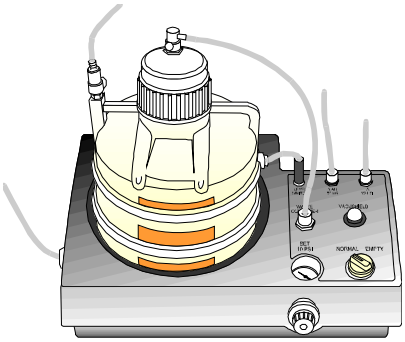
Waste removal system

All analyzer waste is stored in an 11-liter waste container. This container can be a stand-alone container, which has to be emptied manually, or part of the automatic waste removal system. When the fluid level in either of the containers reaches the maximum-level line (approximately 8 liters), an error message appears on the Status line on the personal computer monitor. The analyzer will not aspirate any more samples until the waste container is emptied.

Stand-alone waste container



Automatic Waste Removal

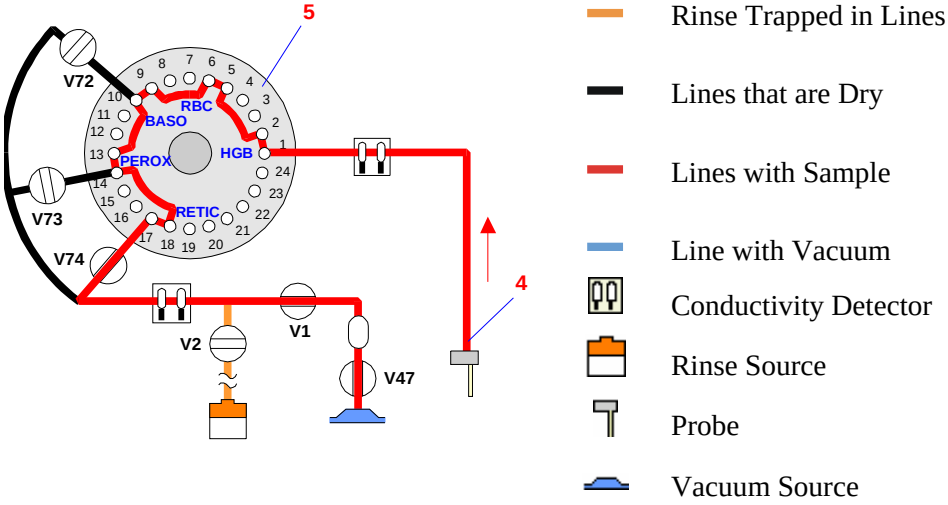


How the ADVIA 2120/2120i Hematology System Works

Blood samples can be aspirated through the:

- Autosampler
- Manual closed-tube sampler
- Manual open-tube sampler

After a sample (**4**) is aspirated, it is drawn into the shear valve (**5**). As the shear valve rotates, it “shears” or divides the sample into aliquots for the different types of tests.



The reagents and sample segments are delivered to their respective reaction chambers for mixing and aspiration. (PEROX 2 and PEROX 3 reagents are delivered directly to the perox reaction chamber.)

Once the cytochemical reactions are complete in the reaction chambers, the sample and reagent mixtures from the perox, RBC, baso, and retic reaction chambers are sent to the flowcells for analysis.

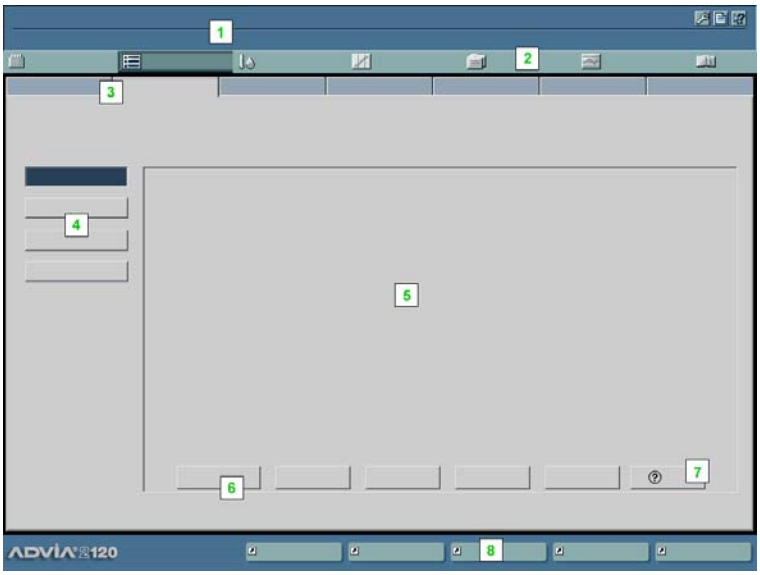
The Hgb reaction chamber serves as an optical cuvette through which the hemoglobin measurement is read.

After analysis, the sample and reagent mixture is evacuated into the waste container and the appropriate pathways and reaction chambers are rinsed.

Test results are sent to the computer to be reviewed and edited.

How the ADVIA 2120/2120i Software Works

The ADVIA 2120/2120i system software is a special-purpose program that runs on the Windows NT operating system. You can navigate through the software and operate the system using the mouse.



1 Status lines
2 Menus
3 Tabs
4 Left-side buttons
5 Main display area
6 Bottom buttons
7 Help button
8 Shortcut keys

Status lines

There are two status lines that display messages about the system. Both lines consist of two parts, each displaying different information.



The system saves all messages in the message log. Click the message icon to view the last 10 messages.

First Status Line

Left Side: Next sample ID, sample type, and test requested

Right Side: Service, Notepad, Help, Printer, and Autoslide icons



Service appears when a scheduled service procedure is overdue.



Notepad appears when there is a new entry in the User Notepad.



Gray Autoslide indicates that communication to Autoslide is not connected.



Green Autoslide indicates that the Autoslide is ready.



Yellow Autoslide indicates that the Autoslide is busy or running utilities. This may also indicate that the Autoslide is offline and in need of attention.



Red Autoslide indicates that a critical Autoslide error has occurred.



Autoslide Service appears when a scheduled Autoslide service procedure is overdue.



To get brief (What's This) Help, click the **Help** icon, then click the item for which you want help.

Second Status Line

Left Side: Current system state, for example, **Ready to Run**

Right Side: System messages and icons that indicate the message severity



Information accompanies a message that provides information only. No operator action is necessary.



Warning alerts you to a condition that requires some action.



Failure alerts you to a serious problem that requires your immediate intervention before work can continue. Most errors of this type are associated with conditions that automatically stop the system.

Menus

Each of the buttons on the top of the screen displays a menu of system functions. The menu appears when you move the pointer over the button. When you click an item on a menu, the corresponding window opens, the button appears to be pressed, and the other functions on the menu appear as tabs arranged beneath the status lines.

NOTE: System Setup on the **Customize** menu contains a submenu. To display the submenu, move the pointer over **System Setup** on the menu. Click an item on the submenu to open the corresponding window.

Tabs

The tabs correspond to the items on the active menu. You can switch to any one of these functions by clicking the corresponding tab. When you select an option from a different menu, the tabs change to those available from that menu.

Left-side buttons

Some tabs contain more than one window. Click these buttons to open the corresponding windows within a tab.

Main display area

When you select an item from a menu or click a tab, the corresponding window appears below the tabs in this area. You can usually switch from one window to another by simply opening the one you want. Some windows, however, do not close automatically and require that you click an **Exit** button before you change to a new one.

Bottom buttons

These buttons activate commands or manipulate the contents of the window.

Help button

When you need detailed Help that provides step-by-step instructions for operating the ADVIA 120, click the **Info** button. To get brief (What's This) Help, click the **?** icon on the status line or press the **Shift** and **F1** keys at the same time, then click the item for which you want help.

Shortcut keys

Click these buttons to open frequently used software tabs without using the menus. You can choose the tabs for which there are buttons using the Shortcut Key Configuration window of the System Setup tab.

Wizards

The software has wizards to help you with complicated procedures. Each wizard guides you through a process by giving you information and prompting your input along the way. You also have the option to perform these procedures without the help of a wizard.

Printing the screen



IMPORTANT: You can print any screen by pressing the Print Screen key. However, pressing the Print Screen key when there is no printer attached to the system can cause the system to malfunction. Make certain that there is a printer attached before you attempt to print the screen.

Results

The ADVIA 2120/2120i system can run five types of tests: CBC, CBC/DIFF, retic, CBC/retic, and CBC/DIFF/retic.

These tests can be selected by:

- Setting the test selectivity to default
- Requesting the test type from the Manual Sample ID tab
- Including the test type on the barcode label
- Including the test type in the workorder

You can select a test up to the time of aspiration. Once aspiration starts, the system assigns the current test selectivity to the sample.

When aspirating samples through the manual open-tube or closed-tube samplers, the test selected will remain the same until a different test is requested.

When running samples on the autosampler, the selectivity will always revert back to the default setting.

The system alerts you to questionable results and potential system conditions in three ways.

- Sample/system flags are codes displayed in the Review/Edit tab and the Run Screen. These codes are associated with a specific test parameter marked by an asterisk. Isolated instances of flags are usually sample related. However, multiple occurrences, especially for consecutive samples, can indicate an analyzer problem.
- Morphology flags are plus signs (+) displayed in the Review/Edit tab and the Run Screen. These flags, one to three plus signs, alert the operator to possible cellular conditions that may require additional laboratory attention, such as preparing a slide for microscopic examination.
- System messages are displayed on the status lines on the PC monitor. Along with the messages, color-coded icons indicate the severity level of the message.

Specifications

Autosampler

Sample Capacity	150 samples
	15 racks of 10 tubes
Tube Sizes	10-13 mm diameter
	50-100 mm height
Tube Types	Some of the allowable tube types:
	Standard VACUTAINER®
	HEMOGARD™
	Center puncture Monovette®
	Venoject® II
Barcode reader	Reads up to 14 digits
	Automatic label code discrimination
	Codabar
	Interleave 2 of 5 with and without check digit
	Code 39
	Code 128 EAN and JAN (8 and 13)

Data Management

- Database storage capacity of 10,000 records, including graphics
- Review and edit capability
 User-defined windows
 User-defined reports
 User-defined ranges based on age and sex for Normal, Rerun, Panic, and Delta Check criteria
- Bi-directional and host query communication protocols
- Quality control
 3D bar graph
 Levey-Jennings plot
 SDI graph
 Table format
- Remote QC

- ILQC programs
- Patient moving average
- User assistance
 Context sensitive help
 Operator’s guide
 Procedure wizards
 Problem solving diagnostics
 Remote diagnostics

Parameters

CBC Results**:**

WBC, RBC, HGB, HCT, MCV, MCH, MCHC, CHCM, RDW, HDW, CH, CHDW, PLT

Differential Results (absolute and %):

NEUT, LYMPH, MONO, EOS, BASO, LUC (Large Unstained Cells)

Platelet Results:

PLT, MPV, PDW, PCT

Reticulocyte Results:

% RETIC, # RETIC, MCVr, CHCMr, CHr

Morphology Results (user definable):

WBC: Left Shift, Atypical Lymph, Blasts*, Immature Granulocytes, Myeloperoxidase Deficiency

RBC: ANISO, MICRO, MACRO, HC VAR, HYPO, HYPER, RBC Fragments, RBC Ghosts, NRBC, Platelet Clumps, Large Platelets

*__Blasts - Limitations__

Smear review by a competent morphologist is necessary to ensure detection of significant blood cell abnormalities. Each laboratory is responsible for developing it’s own protocols for determining which samples require smear review and/or manual differential blood cell counts, based on automated cell count results and clinical information. The system provides morphology and quantitative flags that utilize sophisticated algorithms to assist in the identification of significantly abnormal samples. Laboratory protocols may use these flags internally in their smear review and manual differential specifications. Whenever morphology or quantitative flags are triggered, it is the responsibility of the laboratory to validate the results.

Performance Specifications

Analytical Ranges (Linearity)

WBC	0.02 – 400 x 10^3/ µL
RBC	0.0 – 7.0 x 10^6 / µL
Plt	5.0 – 3500 x 10^3/ µL
Hgb	0 – 22.5 g/dL
Retic	0.2 – 24.5%

Within Run Precision

	Mean	SD	CV
WBC	7.5	0.2	2.7
RBC	5.0	0.06	1.2
Hgb	15.0	0.14	0.93
MCV	90	0.7	0.78
Plt	300	8.8	2.93
Retic%	2.0	0.25	12.5

Carryover

< or = to 1% for all parameters

Personal Computer Specifications (minimum)

Processor	Intel Celeron 2.2 GHz with 512K Cache / 400MHz Front Side Bus Processor Hyper-Threading Disabled
Hard-Drive	40GB (7,200 rpm) IDE Hard Drive - Parallel ATA DiamondMax Plus 8 40GB ATA/133 HDD
CD RW	48x CD-RW (Read & Write) Drive NEC CD-R/RW Drive, Model NR-9300A
Removable storage	3.5", 1.44Mb floppy Drive. - Samsung SFD-321J / ADNR
Network Cards	Integrated Intel Gigabit LOM Network Interface (10/100/1000) 3COM 3C900B-TPC Combo card with BNC connector.
Video controller	Intel Extreme Integrated Graphics 2
Modem	Model Name: Broadcom BCM94212/I V.92 56K PCI Modem Model No.: BCM94212/I

Memory	256MB DDR SDRAM (PC333 Non-ECC) Memory (2x128MB)
Sound system	Integrated Sound Blaster Compatible Sound (AC97 Audio)
External Ports	1 x parallel 1 x serial 8 x USB
Speaker	Internal Dell Business Audio Speaker
Operating System	Microsoft Windows 2000 Professional (Service Pack 3)
File System	NTFS
Expandability	2 x PCI (for the modem and ethernet cards.)
BIOS Requirements	Must be configurable to meet limitations below.
BIOS Limitations	Power management: Suspend Mode S3 AC Power Recovery Off Low Power Mode Disabled Remote Wake Up Off
Chassis	Small Desktop
External Diskette Bays	1 x 3.5" Floppy Bay 1 x 5.25” Floppy Bay
Internal Drive Bays	1 (108 x 390 x 431mm)
Power supply	210W – Model: HP – U2106F3 Rev. H01

Physical Specifications

Electrical Power Requirements	Voltage selectable for single-phase: 100 VAC (6 AMPS) – 240 VAC (3 AMPS) Frequency: 50/60Hz
Temperature Requirements	Operating: 18°C to 35°C Storage: -45°C to 70°C
Relative Humidity	Operating: 15%–80% (non condensing)
Heat Generation	Less than 3000 BTU (less than 880 W)
Audible Noise Level	65 decibels
Installation Category	II
Pollution Degree	**2**
Waste Disposal	Azide-free reagents drain into waste container with automatic level-sensor shutoff. Waste per CBC/diff/retic cycle, including rinse: 12 mL

The ADVIA 2120/2120i Hematology System is for indoor use only.

Operation of the instrument at altitudes of over 2000 meters (6000 feet) is not recommended.

Analytical Module with Autosampler (including reagents)			Analytical Module without Autosampler (including reagents)		
Weight	191.9 kg	422.5 lbs	**Weight**	161.9 kg	357.5 lbs
Height	85 cm	33.4 in	**Height**	85 cm	33.4 in
Width	141 cm	55.5 in	**Width**	81 cm	31.9 in
Depth	68 cm	26.8 in	**Depth**	68 cm	26.8 in

Personal Computer

	CPU	Monitor
Weight	10.6 cm (4.2 in)	7.0 kg (15.43 lbs)
Height	38.9 cm (15.3 in)	Extended in Landscape: 54.6 cm (21.50 in) Compressed in Portrait: 38.0 cm (14.96 in)
Width	38.9 cm (15.3 in)	37.6 cm (14.8 in)
Depth	9.9 kg (22 lbs)	21.3 cm (8.37 in)

Sample mode volumes

Automatic Closed-Tube	175 µL
Manual Closed-Tube	175 µL
Manual Open-Tube	175 µL

Test Selectivity / Throughput

CBC	120 Samples/hr
CBC/diff	120 Samples/hr
CBC/diff/retic	74 Samples/hr
CBC/retic	74 Samples/hr
Retic	74 Samples/hr

Turning the System On / Off

OVERVIEW **2**

TURNING THE SYSTEM ON **2**

TURNING THE SYSTEM OFF **4**

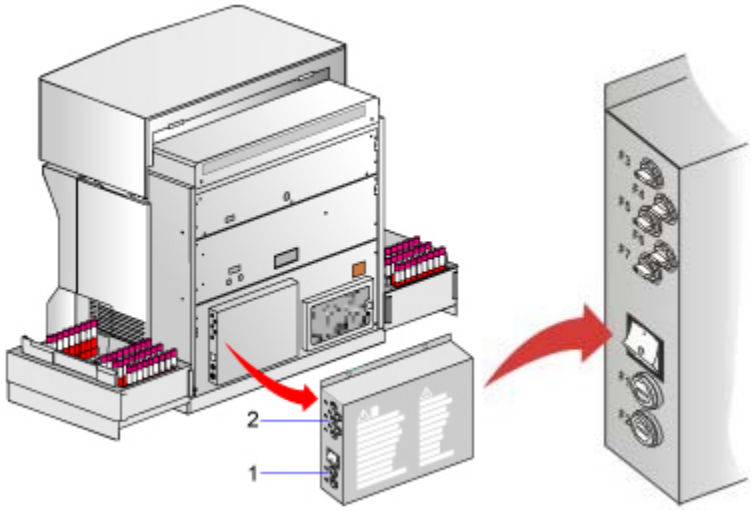
TURNING THE SYSTEM OFF: IN AN EMERGENCY 4
TURNING THE SYSTEM OFF: ROUTINELY 4
EXITING THE ADVIA 2120/2120I SOFTWARE 4

Overview

The ADVIA 2120/2120i Hematology System consists of two main components: the computer and the analyzer. Although there is a main power switch for the system, you must also turn each component on and off individually.

Turning the system on

1. Check that the main power switch is set to On.



 If the switch is in the Off position, switch it to On.

2. Turn on the computer.

 a. Set the computer power switch to On.

 b. When the computer displays the Begin Logon message, select **Ctrl**, **Alt**, and **Delete** at the same time to log on to Windows.

 c. Enter the operator name and password in the Logon Information box. select **OK**.

 d. Once you have logged on to Windows using an operator name and password, the computer automatically starts the ADVIA 2120/2120i software.

 NOTE
 If you log on using a supervisor name and password, the system opens the ADVIA 2120/2120i Shell.

3. Turn on the analyzer.

 IMPORTANT
 When you restart the analyzer, make sure that at least 60 seconds have passed since you turned it off.

 a. Select **On** at the analyzer touchpad.

 b. When the computer finishes loading the software, it displays the Log On / Off tab. A message on the status line indicates system preparation is

in progress. When the system preparation is complete, log on to the system.

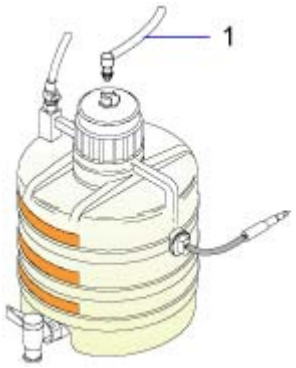
During system preparation, the analyzer:

- Performs internal diagnostics checks
- Prepares the hydraulics
- Primes the reagent lines
- Begins the Startup process

NOTE
If any of the internal diagnostic checks fail, the system displays an error message on the status line. Turn off the system, wait 60 seconds, and then restart it. If the error recurs, call your Service Representative.

c. The system automatically opens the Startup tab. Review the status of the Startup process.

IMPORTANT
In cases when the analyzer is turned off and restarted too quickly, the compressor may not start up, causing the system initialization to fail. This is due to residual vacuum in the waste container. The operator must manually vent the container.



To manually vent either container (manual or autowaste), disconnect the waste container vacuum line (**1**), wait for the vacuum to dissipate, and then reconnect the line.

Turning the system off

IMPORTANT
To ensure good system performance, turn the computer off at least once a week.

You must follow the proper procedure when shutting down the ADVIA 2120/2120i Hematology System. Failure to do so can result in corruption of the database.

Turning the system off: In an Emergency

1. Select **Off** at the analyzer touchpad.
2. If emergency conditions permit, select **Shut Down ADVIA** at the Log On / Off tab.
3. Set the main power switch to Off.

NOTE
When you turn off the analyzer in an emergency, it is unable to drain some lines as it would normally. As a result, when you restart the system, you should perform a System Wash, using the Hydraulic Functions tab on the Utilities menu, before running samples.

Turning the system off: Routinely

1. At the Routine Operations menu, select **Log On / Off**.
2. Select **Shut Down ADVIA**.
 Wait 1–2 minutes while the software shuts down.
3. Set the computer power switch to Off.

Exiting the ADVIA 2120/2120i software

To exit the ADVIA 2120/2120i software without turning off the computer power

1. At the Operations menu, select **Log On / Off**.
2. Select **Shut Down ADVIA**.
 Wait 1-2 minutes while the software shuts down.
3. To restart the software, proceed with step 2 of Turning the Computer On.

Daily Routine

STARTING EACH SHIFT 2

EMPTYING THE WASTE CONTAINER 2
EMPTYING THE OVERFLOW BOTTLE 4
CHECKING THE REAGENTS 4
OBTAINING THE BACKGROUND COUNTS 4

PROCESSING THE SAMPLES 5

CREATING THE WORKORDERS 5
LISTING THE PENDING WORKORDERS 6
RUNNING THE SAMPLES 6
VIEWING THE SAMPLE RUN 8
VALIDATING THE RESULTS 9

ENDING EACH SHIFT 10

WASHING THE SYSTEM 10
PERFORMING THE END OF DAY PROCEDURE 10
LOGGING OFF 11

Starting Each Shift

Emptying the Waste Container

BIOHAZARD WARNING

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended by the Clinical and Laboratory Standards Institute (formerly NCCLS) in *Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition.* 2005. CLSI Document M29-A3. This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

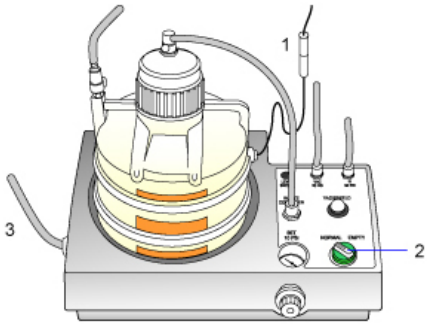
WARNING: Local laws and regulations protect the environment and encourage resource conservation by regulating the disposal of hazardous wastes. Because some of the wastes generated by the analyzer may be classified as hazardous waste, you must be familiar with the applicable hazardous waste handling and disposal laws and regulations in your area.

All analyzer waste is stored in an 11-liter waste container. When the fluid level in the container reaches the “Maximum Level” line (approximately 8 liters), an error message appears on the monitor and an audible alarm is sounded. The system will not aspirate any more samples until the waste container is emptied.

Manual Waste Removal

CAUTION: Make sure all cycles are completed before disconnecting the waste container. The waste container *must* be connected to the system when any system cycles are in progress, including the system startup cycle. If the waste container is not connected, fluid will back up into the UFC and damage the system.

1. Make sure that the analyzer is not sampling.
2. If a message requesting a rinse or a wash displays, select **Cancel**.
3. Disconnect the waste line (**1**) and the vacuum line (**2**). To do this, select the buttons (**3**) on the quick-release connectors as you pull the lines straight up.
4. Disconnect the level switch sensor connector (**4**) by selecting its button.



5. Replace the full container with an empty one and connect the waste and vacuum lines and level sensor to the new container.

CAUTION: Do not open the waste container cap! If the cap is loosened or not replaced correctly, sufficient operating vacuum cannot be reached.

6. Empty the full container by opening the spigot (**5**) into a drain that is capable of accommodating a flow rate of approximately five liters per minute. Total drainage time will be about two and a half minutes.

7. When the waste container is empty, close the spigot and store the container for future use.

IMPORTANT: Make sure that the spigot is closed securely; otherwise, sufficient operating vacuum may not be reached.

Automatic Waste Removal

CAUTION: Make sure all cycles are completed before disconnecting the waste container. The waste container *must* be connected to the system when any system cycles are in progress, including the system startup cycle. If the waste container is not connected, fluid will back up into the UFC and damage the system.

IMPORTANT: In order to empty the automatic waste removal system, the analyzer must be on and must *not* be in Standby mode.

1. Make sure that the analyzer is not sampling.

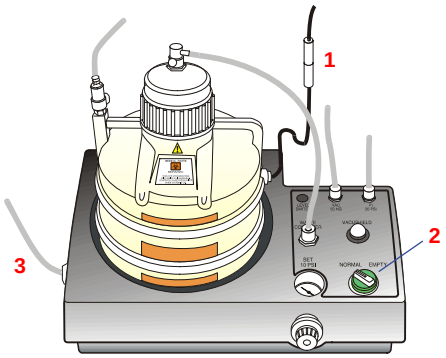
2. If a message requesting a rinse or a wash appears, select **Cancel**.

3. Disconnect the level-sensor switch connector (**1**) by selecting its button.

CAUTION: To prevent sample aspiration while the automatic waste removal system is draining, disconnect the level-switch sensor. Sample aspiration during waste removal may damage the analyzer.

4. At the waste removal assembly tray, turn the mode selector knob (**2**) from **NORMAL** to **EMPTY**.

5. The waste in the container should start to empty. It will take between two and five minutes to completely empty the container. When you see air bubbles in the discharge line (**3**), the container is empty.



6. Once the container is empty, reconnect the level-sensor switch (**1**) and turn the mode selector knob (**2**) back to the **NORMAL** setting.

Emptying the Overflow Bottle

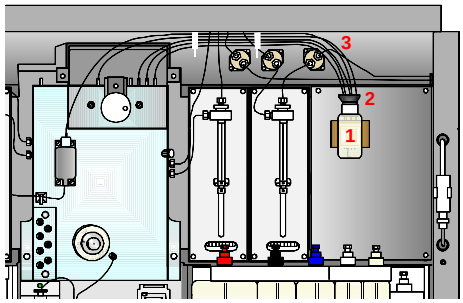
IMPORTANT: If liquid consistently accumulates in the overflow bottle, call your local service provider or distributor.

BIOHAZARD WARNING

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended by the Clinical and Laboratory Standards Institute (formerly NCCLS) in *Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition.* 2005. CLSI Document M29-A3. This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

1. Visually check the fluid level in the small overflow bottle (**1**) located to the right of the RBC sample and sheath pumps. If it has any liquid in it, empty the bottle.
2. Snap the bottle (**1**) out of the clip, then remove the bottle cap (**2**). You can allow the lines (**3**) with the cap to hang loosely.



3. Empty the contents of the bottle in accordance with proper laboratory practices and environmental regulations.
4. Replace the cap, then snap the bottle in place.
5. Make sure that the tubes are not pinched and have not slipped through the cap. The ends of the tubes should be at least 1.5 inches from the bottom of the bottle. Adjust if necessary.

Checking the Reagents

1. Use the Startup tab or the Reagent Log tab to check the supply of all reagents except ADVIA 2120/2120i DEFOAMER.
2. Visually check the supply of ADVIA 2120/2120i DEFOAMER.
3. If you need to replace reagents, use the Reagent Log tab.

Obtaining the Background Counts

Run a background count cycle to obtain a BASO WBC background count, a platelet background count, and an HGB Trans.

1. At the Operations menu, select **Startup**.
2. Select **Refresh**.

3. The background results are color-coded.

 - Green Within range
 - Red Out of range

 If any result is out of range, select **Refresh** at the Startup tab to run another background count cycle. If any result is still unacceptable, perform a system wash.

Processing the Samples

Creating the Workorders

The Order Entry window allows you to create and manage workorders at the analyzer. You can also create workorders at the host computer.

Creating Workorders by SID#

1. At the Access menu, select **SID#** (sample ID number).
2. In the SID# box, enter the sample ID, then select **Enter** or select **OK**.
3. **Optional:** Enter sample and patient information. Use the Tab key to move from field to field.
4. Select tests.
5. Select **OK** to confirm the entries.
6. The Access dialog box appears for the next workorder.

Creating Workorders by Patient

1. At the Access menu, select **Pat#**.
2. In the Pat# box, enter the patient number, then select **Enter** or select **OK**.

 If there is more than one workorder for this patient, they are listed.
3. Select **Create** to make a new workorder for this patient.
4. Enter sample and patient information.
5. Use the Tab key to move from field to field.

 You *must* enter a sample ID number.
6. Select tests.
7. Select **OK** to confirm the entries.

 The Access dialog box displays for the next workorder.

Creating Workorders by Patient Name

1. At the Access menu, select **Name**.
2. In the Name box, enter the patient name, then select **Enter** or select **OK**.

 (To view patient list, type ?, then press the Tab key.)
3. If the entered patient name already exists, you can:

Select **Create** to make a new workorder for this patient.

Select **New Patient** to create a new patient file for this name.

4. Enter sample and patient information.
5. Use the Tab key to move from field to field.

 You *must* enter a sample ID number.
6. Select tests.
7. Select **OK** to confirm the entries.

 The Access dialog box displays for the next workorder.

Listing the Pending Workorders

1. At the Customize menu, select **Tools View**.
2. When the tools list appears, double select **File Management**.
3. Select the **Pending** check box.
4. **Optional:** Use the To and From date boxes to restrict listing to workorders created within a specific period of time.
5. **Optional:** Choose a report format from the Format list. DEFAULT is usually sufficient.
6. Select **Display** to view the list, or select **Print** to print it.

Running the Samples

Control Recommendations

- Run controls in accordance with your laboratory protocol.
- Run multilevel controls at the beginning of each shift.

 Siemens recommends the use of ADVIA TESTpoint Hematology Controls (Low, Normal, and High) and ADVIA TESTpoint Reticulocyte Control (Low and High).
- Run controls alone or at the start of the patient workload.
- Optionally, you can run a retained patient sample periodically to monitor performance trends.
- Evaluate all control results before reporting patient results.
- If control results fail to meet the laboratory's established criteria for acceptability, you must evaluate all patient test results obtained in the unacceptable run to determine if the patient results were adversely affected.
- Perform and document appropriate corrective actions, which may include recalibration and reassaying of patient samples, before reporting patient results.

To run samples from the autosampler:

1. Load samples in the following order:
 - Whole blood primer (primer label)
 - Controls (control label)
 - Patient samples (sample ID label)

 a. Insert tube into rack with the barcode label visible above the rack barcode label that indicates the rack number and sample position. Do not twist tube within rack.

 b. Load rack onto input queue with labels facing front of analyzer.
2. If the Standby indicator is lit, press Standby.
3. At the touchpad, select **Start/Stop Sampler**.

 The Start and Rack in Sampler indicators are lit.
4. Evaluate control results or validate patient results when available.

To run samples from the manual closed-tube sampler:

1. If the Standby indicator is lit, select **Standby**.
2. Run samples in the following order:
 - Whole blood primer (primer label)
 - Controls (control label)
 - Patient samples (sample ID label)
3. Scan the tube label or enter the sample information in the Manual Sample ID tab.

 IMPORTANT: Make sure the correct sample ID appears on the status line before aspirating a sample using either the manual open-tube sampler or the manual closed-tube sampler. **Waiting** displays on the status line while the system searches for a matching workorder.

 Make sure the correct sample selectivity appears on the status line. If you run a control with a mismatched selectivity (Example: running a CBC/Diff control with a Retic selectivity), the results will not appear in the Review /Edit tab and, in some cases, the system computer may require a restart.
4. Aspirate the sample.

 a. Insert and push down tube containing the well-mixed sample into the manual closed-tube sampler. Hold tube parallel to the sampler well wall.

 b. Sample is automatically aspirated – the sampling light flashes.

 c. When the sampling light stops flashing, remove the tube.
5. Evaluate control results or validate patient results when available.

To run samples from the manual open-tube sampler

1. If the Standby indicator is lit, select **Standby**.
2. Run samples in the following order:
 - Whole blood primer (primer label)
 - Controls (control label)
 - Patient samples (sample ID label)
3. Scan the tube label or enter the sample information in the Manual Sample ID tab.

 IMPORTANT: Make sure the correct sample ID appears on the status line before aspirating a sample using either the manual open-tube sampler or the manual closed-tube sampler. **Waiting** appears on the status line while the system searches for a matching workorder.

 Make sure the correct sample selectivity appears on the status line. If you run a control with a mismatched selectivity (Example: running a CBC/Diff control with a Retic selectivity), the results will not appear in the Review /Edit tab and, in some cases, the system computer may require a restart.
4. Aspirate the sample.
 a. Position tube so that the sampler probe is immersed into the well-mixed sample.
 b. Immerse the sampler probe only deep enough (approximately 0.25-in.) to ensure aspiration.
 c. Press the aspirate plate. The sampling light flashes during aspiration.
 d. When the sampling light stops flashing, remove the tube.
5. Evaluate control results or validate patient results when available.

Viewing the Sample Run

1. At the Data Manager menu, select **Sample Cont. Panel**.
2. Use the database status area to work with records by sample status.
3. To get a list of samples with a specific status, select the status box, then select **File Mgt**.
4. To validate results for samples with a specific status, select the status box, and then select **Rev/Edit**.
5. The test panel area provides a test-by-test assessment of control performance and a sample listing by time of aspiration. Control color coding is as follows:

■	Green	Control results for test are between target and ±2 SD.
■	Yellow	At least one control result is between +2 SD and +3 SD or -2 SD and -3 SD.
■	Red	At least one control result is lower than - 3 SD or higher than + 3 SD.

Validating the Results

1. At the Data Manager menu, select **Review / Edit**.
2. If not already done, select validation mode and access mode to determine which sample records will be reviewed.
3. Review the displayed results. Scroll to view additional results.
4. You can:
 - Go to step 5 if all results are acceptable.
 - Edit a result.
 a. Select **C.RES** (current result) box for test.
 b. Enter new value or comment code.
 c. Select **End** to exit, or **Next** to edit additional results.
 You can select **Individual** to edit one result, **Successive** to access all results, or **Pending** to access only missing results.
 - Apply a disposition to an individual result.
 a. Right-select the **D** column next to the test you want to receive the disposition.
 b. Select the desired disposition.

 None cancels any previous disposition.

 Rerun repeats test with no dilution using the same sample ID. The letter R displays in D box.

 Exchange swaps information in C.RES and PREV.RUN boxes. The letter X displays in D box.

 Accept indicates result approved by operator. The letter A displays in D box.

 Delete erases the result. The letter D displays in D box.

 Dil.Sample repeats test with specified dilution using a different sample ID. When result is available, select **Dil.Cons** (Diluted sample - Consolidation) to enter result into original sample record.

 Only Accept and Delete are available for control samples.

 The disposition takes effect when you validate the results.
 - Apply a disposition to all results.
 a. Select **Global Disposition**, or select the **Sample** menu and then choose **Global Disposition**.
 b. Select the desired disposition. (See available dispositions above.)
 The disposition takes effect when you validate the results.
5. Select **OK** to validate the sample results.

NOTE: Be sure to complete sample validation (steps 1 through 5) before rerunning a sample. If not, the sample is rerun with the default selectivity.

Ending Each Shift

Washing the System

Perform the system wash procedure at the end of each shift or work period (a maximum of eight hours). After the laboratory shift with the largest number of samples, run three system wash cycles; after other shifts, you need to run only one wash cycle. In addition, if the number of samples in a shift exceeds 400, perform one system wash after the 400th sample.

1. At the Utilities menu, select **Hydraulic Functions**.
2. Select **System Wash**, select **1** for the **Number of Cycles**, and then select **Start**.

Performing the End of Day Procedure

To reset SIDs, and close out the QC and Moving average statistics (Tools View)

1. At the Customize menu, select **Tools View**.
2. When the tools list displays, double-select **End Of Day**.
3. Select **Yes** to confirm that you have finished the workload. If saved, the selections from a previous End of Day operation now appear.
4. Select the **SID RESET** check box to perform a SID RESET.
5. If desired, select the **Q.C. Close Out** check box to transfer the daily QC file into the Cumulative QC file.

 Use the list box to select close out for all controls or a specific control.
6. If desired, select the **MOV. AVG Close Out** check box to obtain a cumulative data point from moving average control statistics with a date earlier than the date in the Up to box.
7. Select **OK** to confirm and start.

To also backup and purge the data files (Tools Modify)

1. At Customize menu, select **System Setup**, and then select **Tools Modify**.
2. When the tools list displays, double-select **End Of Day**.
3. Select the **SID RESET** check box to perform a SID RESET.
4. If desired, select the **Q.C. Close Out** check box to transfer the daily QC file into the Cumulative QC file.

 Use the list box to select close out for all controls or a specific control.
5. If desired, select the **MOV. AVG Close Out** check box to obtain a cumulative data point from moving average control statistics with a date earlier than the date in the Up to box.

6. If desired, select the check boxes for any files you want to back up. Verify the destination for the Q.C. file backup.
7. Select the **Purge Database** check box.
8. Note the values in Total Samples and To be purged fields. In the To be purged field, enter the number of records, if any, you want deleted from the All Complete file.
9. Select **OK** to confirm and start.
10. If you requested a backup in step 6, you will be asked to insert a formatted disk into the disk drive.

 Requirements for backup disks are as follows:

 - Programs: Format one or more disks with the label **PRG**.
 - Dictionaries: Format one disk with the label **DICT**.
 - Cumulative Quality Control: Format one disk, no label is necessary.
 - Database: Four formatted disks are required for 2000 All Complete sample records. The database disks do not need to be labeled. The system will automatically label the disk(s) during the backup procedure.

 When several disks are required, the internal label entered during formatting for each disk must be the same. To visually identify each disk, write a sequence number on the disk paper label only.

 To format and label a disk, select the **Utilities** menu, select **Backup / Restore**, and then select **Format**.

Logging Off

1. At the **Operations** menu, select **Log On / Off**.
2. Select **Log Off**.

Maintaining the Analyzer

SCHEDULE **2**

SYSTEM WASH **3**

CLEANING THE CENTERING COLLAR **3**

CLEANING THE SHEAR VALVE AND ASPIRATION PATHWAYS IN THE UFC **7**

CLEANING THE SHEAR VALVE **7**

CLEANING THE SHEAR VALVE: STEP 1 TAKING THE SHEAR-VALVE FACES APART 8
CLEANING THE SHEAR VALVE: STEP 2 CLEANING THE SHEAR-VALVE FACES 9
CLEANING THE SHEAR VALVE: STEP 3 PUTTING THE SHEAR VALVE BACK TOGETHER .. 9
CLEANING THE SHEAR VALVE: STEP 4 CHECKING ANALYZER PERFORMANCE 10

INSPECTING AND CLEANING THE SYRINGE PLUNGERS PN 067-506-01 AND PN 067-506-02 **10**

REPLACING THE SAMPLER NEEDLES **13**

REPLACING THE SHEATH FILTERS **15**

REPLACING THE 50 OR 1000 µL SYRINGE PLUNGERS PN 067-506-01 AND 067-506-02 **16**

CLEANING THE AIR-CIRCULATION FILTER **19**

INSPECT THE PEROX-CAP VENT HOLE FOR BUILDUP **19**

CLEANING THE AUTOSAMPLER ASPIRATE ASSEMBLY **20**

Schedule

To maintain the operating efficiency of your analyzer, you must perform specific procedures according to the frequency listed below.

After 1000 samples or daily

- Perform a system wash.

 Perform the system wash procedure at the end of each shift or work period (a maximum of eight hours). After the laboratory shift with the largest number of samples, run three system wash cycles; after other shifts, you need to run only one wash cycle. In addition, if the number of samples in a shift exceeds 400, perform one system wash after the 400th sample.

After 2000 samples or weekly, and before recalibration

- Perform an RBC/baso/retic flowcell wash.
- Clean shear-valve and aspiration pathways in the UFC.
- Inspect the centering collars. Clean if necessary.
- Turn off the system.
- Clean the shear valve.

After 16,000 samples or every two months

- Inspect the syringes and plungers, PN 067-B506-01 and PN 067-B506-02. Clean if necessary.
- Replace the 50-µL syringe plungers, PN 067-B506-01.
- Inspect the Perox-cap vent hole for buildup. Clean if necessary.

Every 6 months

- Replace the 1000-µL syringe plungers, PN 067-B506-02.
- Clean the air-circulation filter.
- Replace the autosampler needle and/or the manual sampler needle.

IMPORTANT

In addition to these scheduled procedures, periodic inspections of the UFC pathways, vacuum shuttle, and reaction chambers are essential. If you find buildup or dirt in any of the lines or chambers, clean the line or chamber in question.

System Wash

Time: 6.5 minutes

Analyzer mode: Ready to Run

Perform the system wash procedure at the end of each shift or work period (a maximum of eight hours). After the laboratory shift with the largest number of samples, run three system wash cycles; after other shifts, you need to run only one wash cycle. In addition, if the number of samples in a shift exceeds 400, perform one system wash after the 400th sample.

Example 1: Laboratory workload of 1000 samples/day

Shift 1	800 Samples	1 system wash after sample 400
		3 system washes at the end of the shift
Shift 2	100 Samples	1 system wash at the end of the shift
Shift 3	100 Samples	1 system wash at the end of the shift

Example 2: Laboratory workload of 300 samples/day

Shift 1	175 Samples	3 system washes at the end of the shift
Shift 2	75 Samples	1 system wash at the end of the shift
Shift 3	50 Samples	1 system wash at the end of the shift

Example 3: Laboratory workload of 350 samples/day

Shift 1	350 Samples	3 system washes at the end of the shift

IMPORTANT

Each **EZ KLEEN** container (PN T01-3624-54) is sufficient for 20 system wash cycles. Please order your reagents accordingly.

To start a system wash

1. At the Utilities menu, select **Hydraulic Functions**.
2. Select **System Wash**, select **1** for the Number of Cycles, then select **Start**.

Cleaning the Centering Collar

Clean the centering collars and bases if there is residue buildup.

Inspect the autosampler aspirate assembly area for salt buildup. Clean if necessary.

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

Biohazard warning

Materials required

- Beakers (2)
- Cotton swab
- Household bleach
- Paper towels
- Stylet or thin wire
- Syringe
- Tubing, 0.020-inch ID

Time: 10 minutes per centering collar

Analyzer mode: Off

WARNING

The analyzer *must* be off; otherwise, personal injury from the needle may occur.

To clean the centering collar

WARNING

To avoid personal injury and exposure to a potential biohazard, you must cover the needle with the red needle cover immediately after you remove the centering collar. Be careful not to bend the needle as you slip the cover over it.

1. Turn off the analyzer.
2. Remove the centering collar from the Autosampler or Manual closed-tube sampler (see specific procedures below).
3. Place the centering collar in a beaker filled with 25% solution of household bleach and water and let it soak for five minutes.
4. Using a cotton swab, scrub off any remaining residue, then rinse with water.

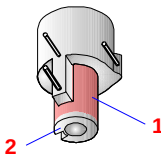
5. Use a stylet or a piece of thin wire to clean the three nipples and the center bore on the autosampler centering collar or the nipple and center bore on the manual closed-tube sampler centering collar.

6. Attach a piece of 0.030-inch ID tubing to a syringe, then flush each port on the autosampler collar or the waste port on the manual closed-tube sampler collar with water.

IMPORTANT

To prevent autosampler centering collar lock ups, apply Parker Super O-lube (or equivalent lubricant) to the barrel part (**1**) of the centering collar.

Do not get lubricant near the needle port or the needle base (**2**).

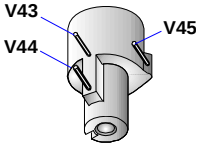


NOTE

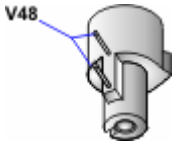
The dual Autosampler has two centering collars, one for analyzer sampling and one for optional Autoslide sampling. Both Centering collars use the same cleaning method.

7. Reconnect all the tubes, except the sample line on the autosampler, to the centering collar

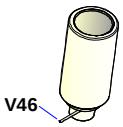
Analyzer centering collar



Autoslide centering collar



MCTS



8. Remove the needle cover and carefully replace the collar over the needle. On the autosampler centering collar, be sure to turn the spring-loaded knob back to its original position.

9. On the autosampler, reposition the autosampler aspirator assembly. Make sure that it drops firmly in place over the guide pins, then reconnect the sample line to the base of the centering collar.

CAUTION

After repositioning the aspirator assembly, finger-tighten the thumb screws, being careful that they are not cross threaded. Overtightening of the screws can warp the baseplate, which will cause misalignment of the sampler. Mis-threading the thumb screws can cause needle damage.

10. Place the tubes going to the autosampler centering collar into the "hook" on the side of the IDee reader.

11. Snap the manual-sampler centering collar into place.

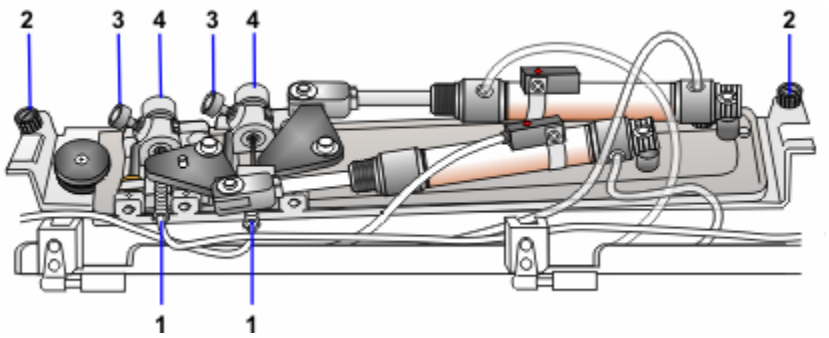
12. Close the analyzer cover.

13. Turn on the analyzer power.

14. Check saline background count and run whole blood primers to verify system performance.

To remove the centering collar from the autosampler

1. Tilt the front cover down.



2. Remove the sample line (**1**) from the bottom of the needle base.

CAUTION

You must remove the sample line before the aspirator assembly is tilted forward. If the line stays in place, it can break as the assembly is tilted.

3. Loosen the thumb screws (**2**) and tilt the autosampler aspirator assembly forward.

4. Pull up the spring-loaded knob (**3**), turn it a ¼ turn, then remove the centering collar (**4**) by pulling it up and out.

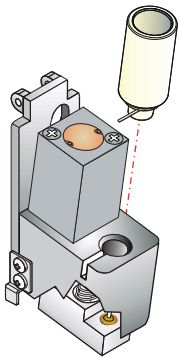
NOTE
If the centering collar is locked into place, squirt a little warm DI water over the collar to loosen it.

5. Place the red needle cover over the needle.

6. Remove the three tubes from the collar.

To remove the centering collar from the manual closed-tube sampler

1. Tilt the front cover down.
2. Pull the centering collar up.
3. Remove the tubing from the nipple.
4. Place the red needle cover over the needle.



Cleaning the Shear Valve and Aspiration Pathways in the UFC

Time: 15 minutes

Materials required: Beaker, household bleach, and water

Analyzer mode: Ready to Run

To clean the shear-valve and aspiration pathways in the UFC

1. At the Utilities menu, select the **Exerciser** tab.
2. Select the **Syringe Pumps** button on the left. If the arrow on the image of the valve under Selector Valve does not point to Open**,** select on the image until the arrow does point to Open**.**
3. Select **Valves** on the left.
4. Select valve **V72** to close.
5. Select valves **V1**, **V47**, and **V74** to open.
6. Hold a beaker of household bleach under the open-tube sample probe until 5 mL is aspirated.
7. Repeat step **4** using 5 mL of water.



Closed valve



Opened valve

8. Close valve **V74** and select **V72** to open. Make sure that **V73** is closed.
9. Repeat steps **4** and **5**.
10. Select **V74** and **V72** to close, and select **V73** to open.
11. Repeat steps **4** and **5**.
12. Close valves **V1**, **V47**, and **V73**. Exit the Exerciser by selecting the Analyzer Status tab.

Cleaning the Shear Valve

Materials required:

- Beaker
- Household bleach
- Paper towels
- Squirt bottle
- Ultrasonic bath (if available)

Time: Cleaning - 15 minutes

Checkout - 15 minutes

Analyzer mode: Standby

Clean the shear-valve faces before recalibrating the system.

High-volume laboratories or laboratories that handle dialysis samples or overly viscous blood, such as aged samples, may need to clean the shear-valve faces more often.

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

To clean the shear valve

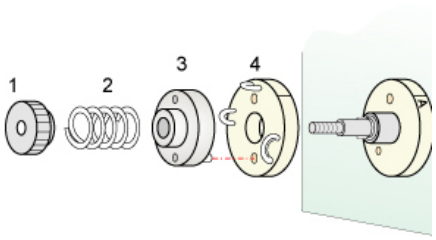
1. Take the shear valve apart
2. Clean the shear valve
3. Reassemble the shear valve
4. Check the analyzer

Cleaning the Shear Valve: Step 1 Taking the Shear-Valve Faces Apart

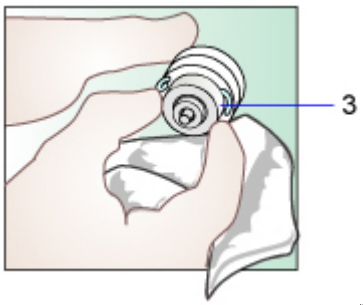
IMPORTANT

Place paper towels directly under the shear valve to prevent fluid from dripping down into the analyzer.

1. Remove the knurled nut (**1**) by turning counter clockwise ↺, then remove the compression spring (**2**).

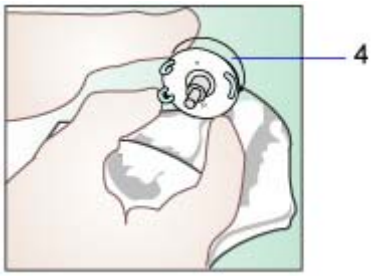


2. To remove the rotor (**3**), hold the shear valve with one hand and with the other hand rotate the rotor until it can be pulled forward and off the shaft.



3. To remove the front shear face (**4**), gently rotate the front face until it is loosened, then pull forward and remove.

 The rear shear face is stationary.



CAUTION

To avoid damaging the seal that secures the shear valve to the acrylic layer of the UFC, do not use excessive force to remove the front shear face.

DO NOT use sharp objects, such as a screwdriver, to separate the shear faces. If you have difficulty removing the rotor or the front shear face, hold paper towels under the shear valve and squirt the valve with a stream of warm water. If the rotor is off, squirt some water into the two holes in the front of the shear face. Allow it to soak for a few minutes, then remove the rotor and/or shear face.

If you still have difficulty separating the shear faces, use the shear face removal tool (PN 067-1083-01) found in the spare parts kit. Gently wedge the sharp edge of the tool between the two faces, then remove the front shear face.

Cleaning the Shear Valve: Step 2
Cleaning the Shear-Valve Faces

1. Place the front shear face in a beaker with household bleach. If the laboratory is equipped with an ultrasonic bath, follow the instructions provided by the manufacturer. Otherwise, let the shear face soak in the beaker for 10 minutes, then thoroughly rinse with water.
2. To rinse the rear shear face, use a wash bottle filled with water. Use paper towels to catch dripping water.

CAUTION

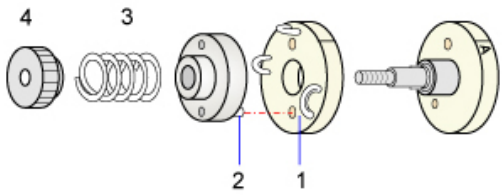
Do not wipe the shear faces with paper towels. This may leave fibers on the shear faces.

Cleaning the Shear Valve: Step 3
Putting the Shear Valve back Together

CAUTION

You may assemble the shear valve while the faces are still wet. Never use paper towels, gauze, or cotton swabs on the shear faces. These may leave fibers on the surface that can clog the precision grooves.

1. Shake off any excess water, then install the front face on the shaft by aligning the black line on the front face with the black line and the **A** on the rear face. The smaller loops should be at the 9 and 11 o'clock positions and the large loop should be at the 5 o'clock position.



2. Install the rotor by inserting the drive pin (**2**) into the hole (**1**) on the right side of the front face.

3. Replace the spring (**3**), and the knurled nut (**4**). Hand tighten the nut.

Cleaning the Shear Valve: Step 4 Checking Analyzer Performance

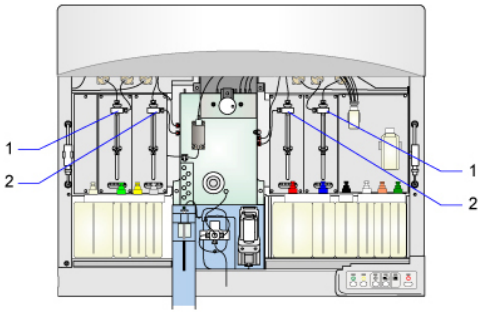
Check analyzer performance by:

- Checking saline backgrounds
- Running a whole blood primer
- Running controls

 If controls do not recover, calibrate affected channel.

Inspecting and Cleaning the Syringe Plungers PN 067-506-01 and PN 067-506-02

Inspect the tip of the plunger during a saline prime.



The normal wear of the plunger tip (sheath **1** [1000 µL syringe] and sample **2** [50 µL syringe]) against the syringe barrel can cause small pieces to be detached. These small particles appear as a gray gel at the tip of the plunger. If this gel enters the hydraulic system, it can cause clogs in the analyzer. Clean if necessary.

Materials required:

- Lint-free tissue
- Small hex wrench

Time: 15 minutes for one plunger

Analyzer mode: Off

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

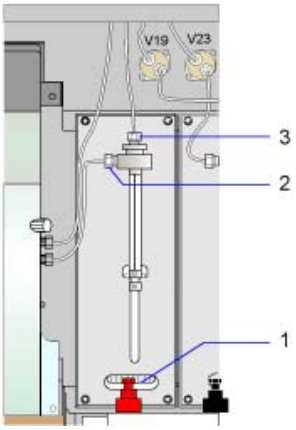
To clean the syringes and plungers

1. Remove the syringe.

 a. Turn the thumb wheel (**1**) counterclockwise ↺ until the plunger is lowered about ½ inch (1.27 cm).

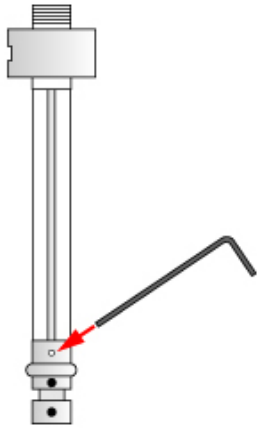
 b. Disconnect the input (**2**) and output (**3**) fittings from the syringe head.

 c. Remove the nut and washer that secure the syringe at the top. Slide the syringe barrel down toward the bottom of the carriage to clear the mounting hole, then remove.



CAUTION

When cleaning the 50 µL syringe, never pull the plunger through the small plastic bushing inside the syringe. This will cause damage to the syringe plunger tip. Use a small hex wrench to pop the bushing all the way out of the syringe, then remove the plunger from the syringe with both bushings still on the plunger stem. Do not remove the plastic bushings from the 50 µL plunger.



2. Remove the dirty plunger from the syringe. Do not remove the white bushing from the plunger or the plunger from the stainless steel barrel bushing on the bottom. Using a soft lint-free tissue, gently wipe the plunger tip. Make sure all debris is removed from the grooves.
3. Thoroughly rinse the syringe barrel with water.
4. Slide the cleaned plunger into the syringe. Use a little saline solution, if necessary. Reseat the small plastic bushing into the syringe barrel, then replace the syringe
 a. Insert the bushing end of the syringe into the slot at the bottom of the carriage.
 b. Make sure that the input port on the RBC/Baso/Retic channel is facing left, and on the Perox channel it is facing right.
 c. Slide the syringe up and into the mounting hole in the pump drive frame.
 d. Install the washer and the knurled nut and hand tighten the nut.

 CAUTION

 Be careful not to cross-thread or overtighten the knurled nut and the input/output fittings.

 e. Reconnect all the syringe fittings.
5. Check analyzer performance by
 - Checking saline backgrounds
 - Running a whole blood primer
 - Running controls

Replacing the Sampler Needles

There are two needles in the analyzer. One is located in the autosampler and the other is in the manual closed-tube sampler.

Materials required:

- Cotton swab
- Lens tissue
- Replacement needle, PN 113-3301-03

Time: 5 minutes per needle

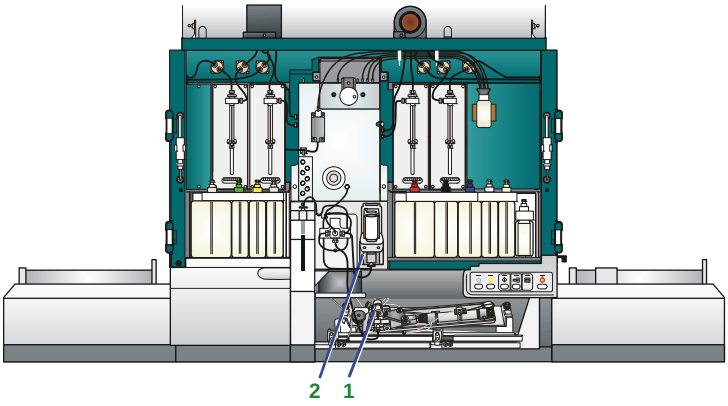
Analyzer mode: Off

WARNING

The analyzer must be off; otherwise, personal injury from the needle may occur.

Location of the sampler needles and centering collars

- Autosampler (**1**)
- Manual closed-tube sampler (**2**)



BIOHAZARD

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To replace the sampler needles

1. Turn off the analyzer.

2. Remove the centering collar from the Autosampler or the Manual closed-tube sampler. (See page 4-6 for instructions.)

3. Turn the needle cover counterclockwise ↺ to loosen the needle.

4. Discard the needle along with its cover as biohazardous material.

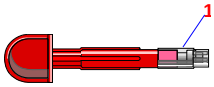
5. Before installing the replacement needle, clean the needle base using a cotton swab soaked in water, then wipe with another cotton swab soaked in water.

 NOTE
 If there is extensive buildup, use a solution of 25% household bleach and water to remove residual dried blood.

6. Install the replacement needle.

 a. Remove the clear plastic end of the needle cover (**1**).

 b. With the red needle cover in place, screw the needle clockwise ↻ into the needle base. Be careful not to cross-thread the needle.



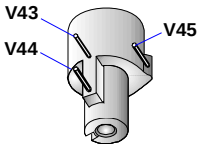
 CAUTION

 Do not use any other tools to secure the needle. Overtightening can affect needle performance.

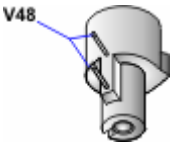
 c. Remove the red cover from the needle and save it for use during the next needle installation.

7. Reconnect all the tubes, except the sample line on the autosampler, to the centering collar

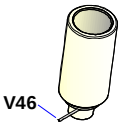
Analyser centering collar



Autoslide centering collar



MCTS



NOTE

The dual Autosampler has two centering collars, one for analyzer sampling and one for optional Autoslide sampling. Both Centering collars use the same sampling needles.

8. Carefully replace the collar over the needle. On the autosampler centering collar, be sure to turn the spring-loaded knob back to its original position.

9. On the autosampler, reposition the autosampler aspirator assembly. Make sure that it drops firmly in place over the guide pins, then reconnect the sample line to the base of the centering collar.

CAUTION

After repositioning the aspirator assembly, finger-tighten the thumb screws, being careful that they are not cross threaded. Overtightening of the screws can warp the baseplate, which will cause misalignment of the sampler. Mis-threading the thumb screws can cause needle damage.

10. Place the tubes going to the autosampler centering collar into the "hook" on the side of the IDee reader.
11. Close the front cover.
12. Run saline and whole blood primers to verify system performance.

Replacing the Sheath Filters

There are two sheath filters located on either side of the analyzer. The perox sheath filter is in a green housing on the left side and the RBC/baso sheath filter is in a clear housing on the right side of the instrument.

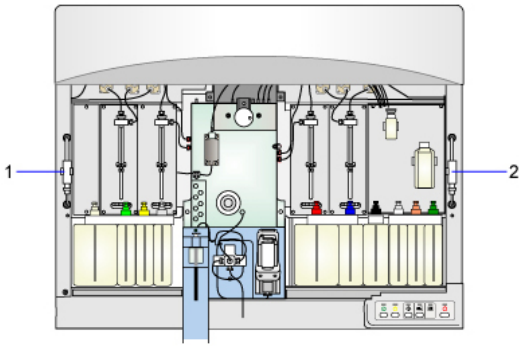
Time: 10 minutes

Materials required:

- Perox sheath filter
 PN 518-3148-05
- RBC/baso sheath filter
 PN 518-3148-06
- paper towels

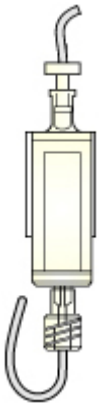
Analyzer mode: Ready to Run

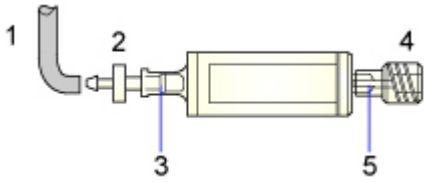
Location of the perox (1) and the RBC/baso (2) sheath filters



To replace the sheath filters

1. Carefully pull the filter toward you just enough to remove it from its mounting and gain access to the tubing. Place paper towels under the filter to catch any fluid that leaks out when you remove the filter.
2. Disconnect the reagent line (**1**) attached to the barbed fitting (**2**) at the input port (**3**) of the filter.





3. Disconnect the luer fitting (**4**) from the connector at the output port (**5**). **Do not** disconnect the line leading from the luer fitting.
4. Discard the filter according to local environmental laws and regulations.
5. Hold the replacement sheath filter by the body and attach the luer fitting to the connector. Turn the luer fitting clockwise ↻ to tighten.

CAUTION

The plastic barbed fitting and the luer connector are very fragile. Hold the sheath filter by its body at all times and do not use excessive force when the lines are being connected.

6. Still holding the filter by the center of the body, connect the reagent line to the barbed fitting of the input port.
7. Insert the sheath filter into the mounting clip with the input end of the filter facing up.
8. Prime the reagent lines five times.

CAUTION

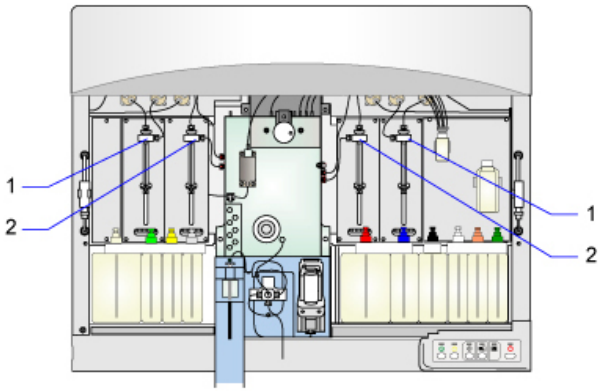
Do not use a syringe to prime the filter. It may cause damage to the filter.

9. Look at the level of the liquid in the sheath filter. If the filter is not approximately 90% full, run two additional prime cycles.

Replacing the 50 or 1000 µL Syringe Plungers PN 067-506-01 and 067-506-02

Materials required:

- Hex wrench, small
- Household bleach
- Sample syringe repair kit, PN 067-B506-01 (50 µL)
- Sheath syringe repair kit, PN 067-B506-02 (1000 µL)



Time: 15 minutes

Analyzer mode: Off

NOTE

The sheath syringe plungers (**1**) will

last two to three times longer than the sample syringe plungers (**2**).

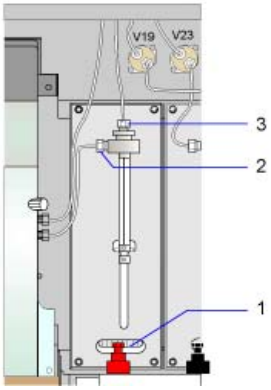
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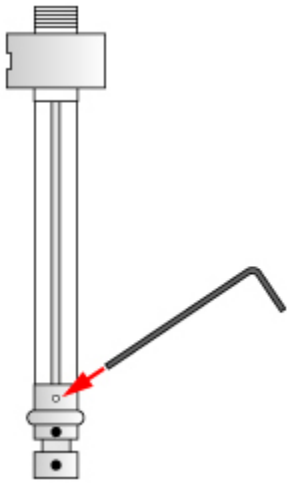
To replace the syringe plunger

1. Turn the thumb wheel (**1**) counterclockwise ↺ until the plunger is lowered about 0.5 inch (1.27 cm).
2. Disconnect the tubing from the top fittings, then disconnect the input (**2**) and output (**3**) fittings from the syringe head.
3. Remove the nut and washer that secure the syringe at the top. Slide the syringe barrel down toward the bottom of the carriage, then remove.

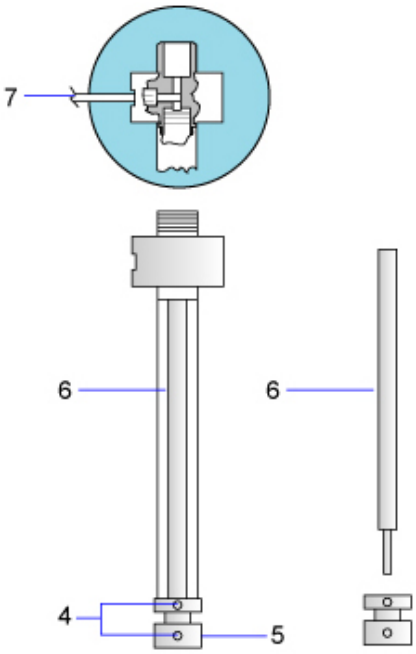


CAUTION

The 50-µL syringe plunger has a small plastic bushing inside the syringe. When replacing this plunger, **never** pull the plunger through the small bushing. This action will cause damage to the plunger tip. Use a small hex wrench or a large paper clip to pop the bushing out of the syringe completely, then remove the plunger from the syringe with the bushing still on the plunger stem.



4. Use a hexagonal wrench to loosen the set screws (**4**) on the metal bushing (**5**) on the plunger stem. Remove and keep the bushing. Discard the plunger (**6**).



5. Inspect the syringe. If the inside surface is dirty, use a wash bottle with 25% solution of household bleach and water to clean it. Rinse thoroughly with water.

6. Install the new plunger:

 a. Insert the pin gauge (**7**) from the repair kit into the input port of the syringe

 b. Wet the plunger with saline solution and insert it into the syringe barrel. Slide the plunger up until it touches the pin gauge.

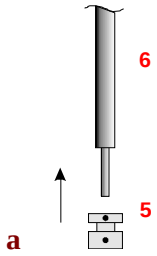
CAUTION

Do not force plunger into the syringe. Forcing will distort the tip.

 c. On the 50-µL syringe, replace the small plastic bushing into the syringe.

 d. Replace the metal bushing onto the plunger stem with the narrow collar of the bushing (**5**) toward the plunger (**6**).

 e. Push the metal bushing up against the syringe, then tighten the set screws (**4**).



 f. Remove the pin gauge from the input port.

7. Reinstall the sample syringe:

 a. With the metal bushing end-first, insert the syringe plunger into the slot at the bottom of the carriage.

 b. Slide the syringe up and into the mounting hole in the pump drive frame with the input port facing left on the RBC/baso/retic channel and facing right on the perox channel.

 c. Install the washer and the knurled nut and hand tighten the nut.

CAUTION

Be careful not to cross-thread or overtighten the knurled nut and the input/output fittings.

 d. Reconnect all the tubing to the syringe fittings.

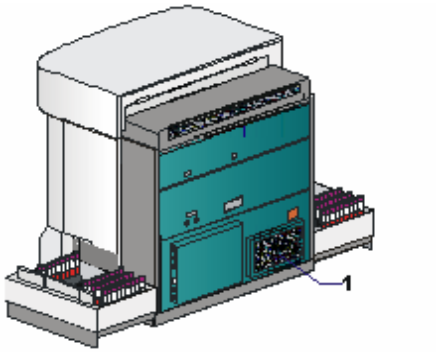
8. Check analyzer performance by:
 - Checking saline backgrounds
 - Running a whole blood primer
 - Running controls

 If controls do not recover, calibrate the affected channel.

Cleaning the Air-Circulation Filter

Time: 5 minutes

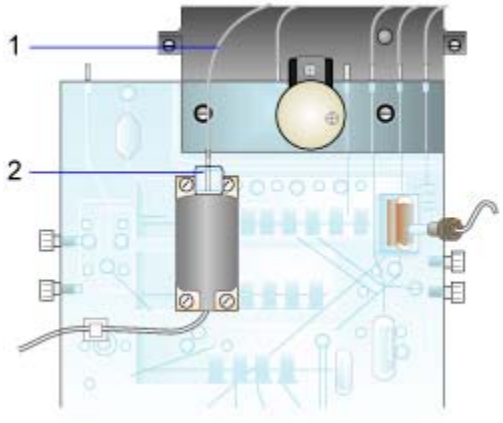
Location of the air filter (1)



To clean the air filter

1. Remove the filter by sliding it to the right, out of its frame.
2. Remove excess dust or lint from the filter by tapping it against a clean, hard surface or by vacuuming.
3. Flush the filter with a strong stream of water, first on one surface then on the other surface.
4. If the filter remains dirty, swish it around in a container filled with warm water and mild detergent.
5. Rinse the filter with clean water, then allow it to air dry.

Inspect the Perox-Cap Vent Hole for Buildup



1. Disconnect the overflow tube (**1**) from the perox vent.
2. Remove the cap (**2**).
3. Look at the inside of the cap and look through the vent opening. Make sure that the cap and the vent are clean, dry, and free of buildup.

4. If necessary, clean the cap and the vent opening. Use the drill bit included in the flowcell cleaning kit (**PN 113-B711-01**) to clean blockages in the vent opening.

5. Replace the cap and reconnect the overflow tube.

Cleaning the Autosampler Aspirate Assembly

Clean the autosampler aspirate assembly if there is a salt buildup.

BIOHAZARD

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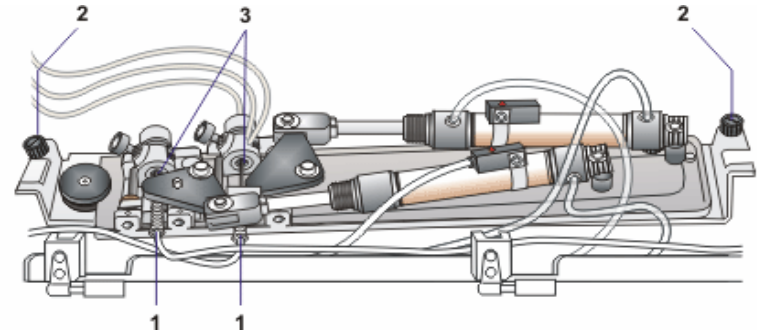
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Time: 15 minutes

Materials required:

- Cotton swab
- Deionized water
- Paper towels
- Squirt bottle

Analyzer mode: Off



To clean the autosampler aspirate assembly

1. Turn off the analyzer.
2. Tilt the front cover down.
3. Thoroughly rinse the autosampler aspirate assembly with deionized water.

NOTE

Single aspirate assemblies have one needle, centering collar and air cylinder.

4. Remove the sample line (**1**) from the bottom of the needle base.

CAUTION

You must remove the sample line before the aspirator assembly is tilted forward. If the line stays in place, it can break as the assembly is tilted.

5. Loosen the thumb screws (**2**) and tilt the autosampler aspirator assembly forward, then thoroughly rinse the back side of the assembly with deionized water.
6. Clean the centering collar. Make sure that you remove all buildup at the mating surface (**3**) of the centering collar and the assembly.
7. Allow to stand for 5 minutes, then wipe the assembly dry with paper towels and cotton swabs. Repeat if necessary.
8. Reposition the assembly. Make sure that it drops firmly into place, then reconnect the sample line.

CAUTION

After repositioning the aspirator assembly, finger-tighten the thumb screws, being careful that they are not cross threaded. Overtightening of the screws can warp the baseplate, which will cause misalignment of the sampler. Mis-threading the thumb screws can cause needle damage.

9. Place the tubing going to the centering collar into the "hook" on the side of the IDee reader.

Troubleshooting the Analyzer

ALIGNMENTS AND ADJUSTMENTS 2

ADJUSTING THE HGB BASELINE VALUE 2
ADJUSTING THE LENGTH OF THE SAMPLE PROBE 3
ADJUSTING THE PNEUMATIC REGULATORS 3
MAXIMIZING THE PEROX LAMP OUTPUT 4
REPROGRAMMING THE MANUAL BARCODE READER 5

CLEANING PROCEDURES 5

BACKFLUSHING THE DRAIN FILTERS 5
CLEANING THE PEROX CHAMBER 7
CLEANING THE AUTOSAMPLER RINSE-TO-WASTE LINE (V45 PATHWAY) 8
CLEANING THE VENT LINES, VACUUM SHUTTLE CHAMBERS, AND REACTION CHAMBERS 9
FLOWCELL WASH 10
CLEANING THE FLOWCELLS ON THE ANALYZER 11
CLEANING THE FLOWCELLS OFF THE ANALYZER 12
BACKFLUSHING THE PEROX FLOWCELL AND SHUTTLE AND REACTION CHAMBERS 21
BACKFLUSHING THE RBC/BASO/RETIC FLOWCELL AND SHUTTLE AND REACTION CHAMBERS 23

REPAIR AND REPLACEMENT 25

REPLACING THE CLOT FILTERS 25
REPLACING THE DIAPHRAGM PUMPS 26
REPLACING THE DRAIN FILTERS 27
REPLACING A PEROX CHECK VALVE 29
REPLACING THE FRONT SHEAR FACE OR THE SHEAR VALVE ROTOR 29
REPLACING THE FUSES 31
REPLACING THE HEMOGLOBIN COLORIMETER LAMP 33
REPLACING THE HYDRAULIC VALVES 34
REPLACING THE OPEN-TUBE SAMPLER PROBE 37
REPLACING THE PEROX LAMP 38
REPLACING THE PEROX FLOWCELL 39
REPLACING THE RBC/BASO/RETIC FLOWCELL 42
REPLACING THE SYRINGES 45
REPLACING THE VACUUM PUMP FILTER (VACUSHIELD) 45
REPLACING THE WASH BLOCK 47

TROUBLESHOOTING TIPS 49

AUTOSAMPLER TROUBLESHOOTING TIPS 49
CANNOT FIND VIDEOS 49
CHECKING DRAIN FILTERS FOR CLOGS 49
COMPRESSOR DOES NOT START 49
DATA MANAGER AND LIS 50
NO SOUND WHEN VIEWING VIDEOS 50
PEROX CHAMBER 51

If you are unable to correct a problem and require service assistance, please contact your local technical support provider or distributor.

Alignments and Adjustments

Adjusting the Hgb Baseline Value

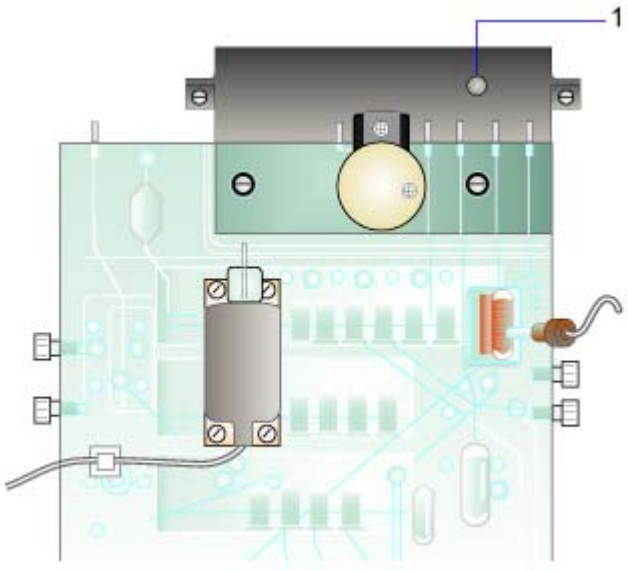
When to adjust the Hgb colorimeter-lamp baseline value

- After replacing the lamp.
- If the baseline value is >4.2 volts.
- If indicated during troubleshooting.

To adjust the Hgb baseline value

1. At the Procedures menu, select the **Adjust Lamp/Temp** tab.
2. Select **Hgb Baseline**.
3. Pop out the small white plug on the colorimeter to access the potentiometer adjustment screw on the Hgb Power Supply Preamp PCB.

 Potentiometer (1) on the Hgb Power Supply Preamp Board

4. Select **Start Cycle**. As the analyzer is checking the baseline value, use a small screwdriver to turn the adjustment screw so that the **Current** value is **4.1**.

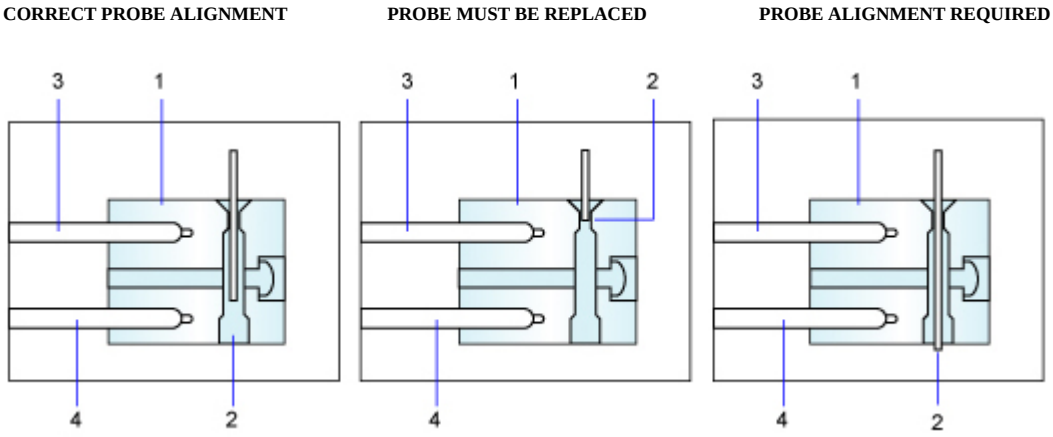
 To increase the value, turn the screw clockwise.

 To decrease the value, turn the screw counterclockwise.

5. Select **Exit** and replace the plastic plug.

Adjusting the Length of the Sample Probe

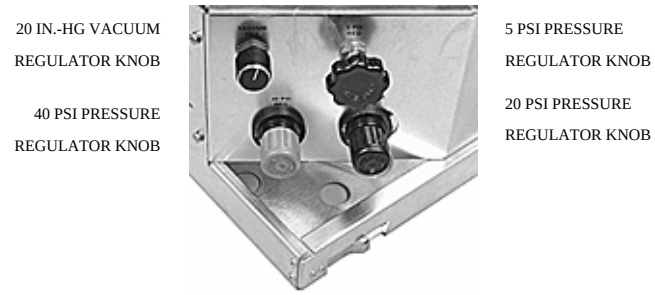
After each aspiration, the wash block (**1**) is lowered and the probe is washed within the block. For a proper wash, the terminal end of the probe (**2**) must be between the upper (**3**) and lower (**4**) ports of the wash block when the block is at its lowest position.



1. Look at the terminal end of the probe in the lowered wash block. If the probe is too short, it must be replaced.
2. If the probe is too long, remove the probe and, using a sharp scalpel or a single-edged razor blade, cleanly cut the probe to the appropriate length. Be very careful to make the cut straight without burrs. *Do not cut the probe on an angle.*
3. Replace the probe and check the length.

Adjusting the Pneumatic Regulators

1. To gain access to the knobs, snap open the white panel on the right side of the analyzer. Using a Phillips-head screwdriver, remove the small green panel.
2. At the Utilities menu, select **Analyzer Status**.
3. Monitor the pneumatic values on the screen as you adjust the appropriate knob.



Turn knobs clockwise to increase values and counterclockwise to decrease values.

You have to first pull the 20 and 40 psi pressure regulator knobs, then turn to adjust.

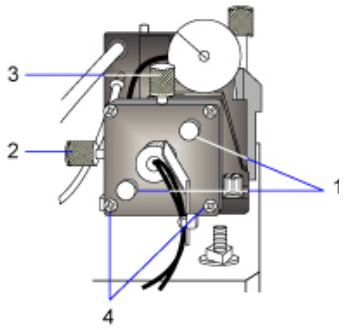
Regulator	Acceptable Reading	Set to
20 in. Hg vacuum	20 ±1 in. Hg	20 +0.5 in. Hg
20 psi pressure	20 ±1 psi	20 +1 psi
5 psi pressure	5 ±0.5 psi	5 +0.25 psi
40 psi pressure	40 ±2 psi	40 +1 psi

IMPORTANT
All pneumatic settings must be reached by turning the knobs in an **upward or clockwise direction only**. If a reading goes above the target value (see column 3 on the left), turn the knob back. Allow the analyzer to equilibrate (get a new reading every 5 seconds), then adjust upward to the correct value.

Maximizing the Perox Lamp Output

The analyzer should be in the **Ready to Run** mode. If it is in **Standby**, the current A/D reading will not update.

1. At the Procedures menu, select **Adjust Lamp/Temp**.
2. Select **Perox Lamp Alignment**.
3. Select **Start Cycle**.
4. Monitor the **Current A/D Reading** field.
5. Loosen the two securing screws (**1**). Do not loosen the four corner screws (**4**).



6. Perform the following procedure even if the initial maximum lamp value is greater than 1.96. Use the side alignment screw (moves the lamp in a horizontal direction) (**2**) and the top alignment screw (moves the lamp in a vertical direction) (**3**) to peak the position of the lamp. The maximum value should be between 1.96 and 4.99 volts. However, if the volts are greater than 4.90, select **Set Light Intensity** first, then return to the Perox Lamp Adjustment window, select **Start Cycles**, and repeat this procedure.

 a. In small increments, first turn the side screw, then the top screw clockwise. If the voltage goes down, turn the screws counterclockwise.

 b. Continue alternately turning the screws in small increments until the maximum value is achieved. The final adjustment should be in the clockwise direction. Allow 5 to 10 seconds for the screen to update between each increment.

NOTE
Achieve the final maximum lamp value in a *clockwise direction only*. This will counteract any spring-bounce that might decrease the output level of the lamp over time.

7. Once the value is maximized, tighten the securing screws (**1**) to lock the lamp into position. Some minor drifting (less than 0.1 volts) is normal.
8. At the Utilities menu, select **Analyzer Status** and check the lamp intensity.

- If the value is at least 120 but less than 255, the perox light source indicator, although displayed in red, is acceptable for reporting results. Results will not be flagged. Check the gains for the perox channel and continue normal operation.
- If the value is less than 119, select **Set Light Intensity**. Check the gains for the Perox channel.

Reprogramming the Manual Barcode Reader

1. Locate the **Codabar Settings** in the Opticon User's Manual.
2. Scan the **Start** (Z7) barcode with the wand. The barcode reader should be emitting a constant beeping sound, which is an indication that it is in the programming mode.
3. Scan the **Do not transmit Start/Stop** (F0) barcode. You should hear a single high-pitched beep to indicate that the scanning was successful.
4. Scan the **End** (Z7) barcode label. A continuous beeping sound indicates that the reprogramming is finished.

Cleaning Procedures

Backflushing the Drain Filters

If a drain filter is clogged, replace it with a new filter.

If the filter is not clogged, but you want to clean it because of heavy buildup or discoloration, use this backflush procedure.

Materials required:

- Flowcell cleaning kit, PN 113-B711-01
- Household bleach

Time: 10 minutes

Analyzer mode: Off

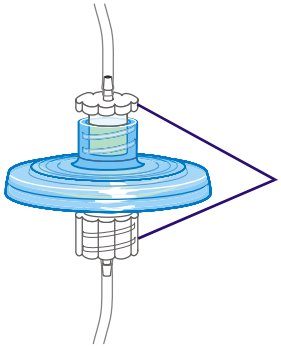
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To backflush the drain filters

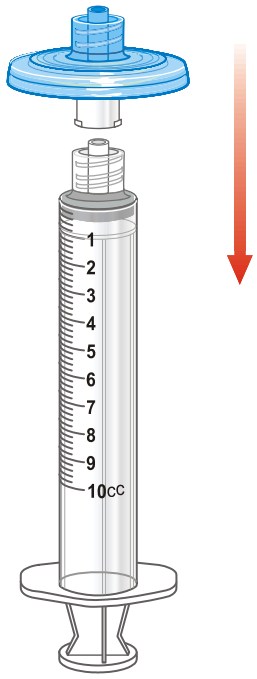
1. Turn the analyzer off.
2. Prepare a 10% household-bleach solution.
3. Unscrew the fittings from each end of the drain filter that you want to flush.
4. Attach the syringe to the bottom of the filter.
5. Insert the filter into the beaker of bleach solution. Gently pull the syringe plunger up,drawing fluid through the filter. Make sure the direction of flow is the opposite of the flow during normal operation.
6. Disconnect the syringe and empty it.



UNSCREW BOTH FITTINGS

WARNING

The debris flushed from the drain filters may contain biohazardous material and should be treated as if it is capable of transmitting infectious diseases.



7. Rinse the filter by repeating steps 4 through 6 twice, using deionized water instead of the bleach solution.
8. Visually inspect the filter and repeat the procedure if necessary.
9. Wipe the outside of the filter using a lint-free cloth or paper towel.
10. Reinstall the drain filter.
11. Clean the syringe with 10% household-bleach solution.
12. Turn the analyzer on and run samples in the manual and autosampler modes. Check to make sure that there are no leaks and that fluid passes through the filters properly. Make sure that the lines do not interfere with the autosampler aspirator motion.

Cleaning the Perox Chamber

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

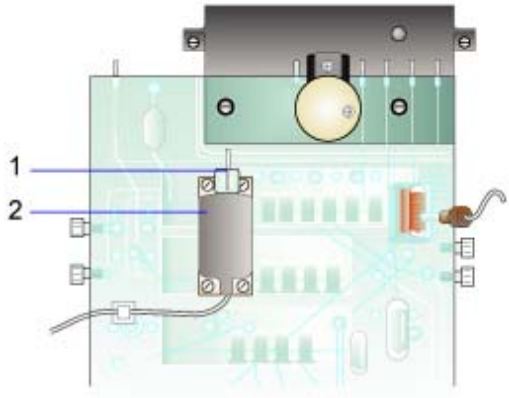
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Materials required:

- Cotton swab
- Dental mirror
- EZ KLEEN
- Flashlight
- Pipette, 2-mm ID, disposable

Time: 2 minutes

Analyzer mode: Ready to Run



1 PEROX CHAMBER CAP
2 PEROX CHAMBER

To clean the perox chamber

1. Remove the perox chamber cap (**1**).
2. Dip a clean, cotton-tipped swab into EZ KLEEN and wipe clean the inside of the perox chamber.

 CAUTION

 To avoid pushing any dirt into the drain and reagent ports at the base and back wall of the chamber, always wipe the chamber by starting at the bottom of the back wall, using a circular up and outward motion.
3. Using a 2-mm disposable pipette, fill the chamber 1/3 full with EZ KLEEN.
4. Using the pipette, agitate the liquid in the chamber, then let it soak for one minute.
5. Agitate the liquid again. Then, using the pipette, remove all the liquid from the chamber.
6. Check if there are any black particles in the liquid. If yes, repeat steps 3 through 6 until the EZ KLEEN is clear when you remove it from the chamber.
7. Using the dental mirror and flashlight, check that the chamber is clean. If it is not clean, repeat steps 3 through 6.
8. Replace the perox chamber cap.
9. Perform a System Wash.

Cleaning the Autosampler Rinse-to-Waste Line (V45 Pathway)

Materials required

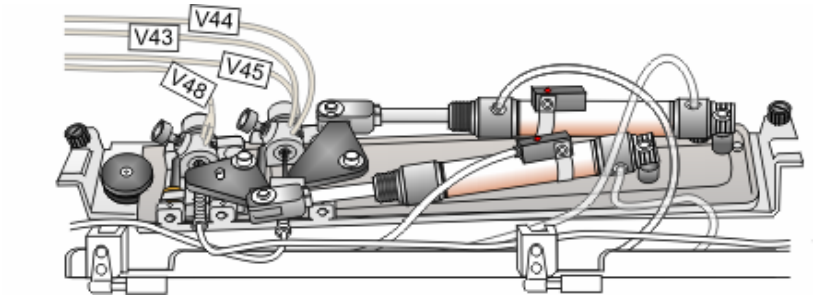
- Beaker
- Deionized water

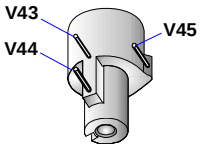
- Household bleach

Time: 4 minutes

Analyzer mode: Ready to Run

1. Open the front cover.
2. At the Utilities menu, select the Exerciser tab, and select the **Valves** button on the left.
3. Remove the tubing from the **V45** nipple on the autosampler centering collar.





4. Place the end of the tube into a beaker of 25% solution of household bleach and water.
5. At the Exerciser**,** select **V45** to open the valve.
6. Aspirate 10 mL of the bleach, followed by 10 mL of deionized water
7. At the Exerciser, select **V45** to close the valve.
8. Replace the tubing on the centering collar nipple, and exit the **Exerciser** window.

Cleaning the Vent Lines, Vacuum Shuttle Chambers, and Reaction Chambers

Materials required:

- Beaker
- Deionized water
- EZ KLEEN for cleaning perox-related pathways and chambers
- Household bleach for all pathways and chambers other than perox
- Tubing, 0.090, PN 116-0536-16

Time: 4 minutes

Analyzer mode: Ready to Run

NOTE
Clean one vent line or chamber at a time.

1. Remove the tubing from the overflow bottle that leads to the vent of the pathway or chamber that you want to clean. Or, if there is no overflow tube installed, attach a 12-inch (300.5-mm), 0.081-ID piece of tubing to the vent.
2. Put the free end of the tube into a beaker of 25% solution of household bleach and water.

 IMPORTANT
 You must use EZ KLEEN when cleaning the perox vacuum shuttle chamber and perox vent line.
3. Open the valve that will create a vacuum to aspirate the bleach solution from the beaker through the vent line and chamber to the main waste line at the bottom of the UFC block.

 To open a valve, at the Utilities menu, select the **Exerciser** tab. Select **Valves** from the list on the left. Select the appropriate valves.

 The appropriate valves are:

 Baso chamber - open V13

 Perox vacuum shuttle chamber - open V18 and V17

 Retic chamber - open V65

 RBC chamber - open V10

 RBC/baso/retic vacuum shuttle chamber - open V22 and V21

 Hemoglobin chamber - open V36
4. Allow alternate segments of household bleach solution and air to run through the line and the chamber until they are clean.
5. Immerse the free end of the tube into a beaker of deionized water to rinse the line and chamber.
6. Remove the tube from the beaker and close the valve.
7. Exit the **Exerciser**.
8. Replace the tube into the overflow bottle, or if it was not an overflow tube, remove it from the vent opening.
9. At the Startup window, select **Refresh**. Repeat **Refresh** until the background counts are acceptable.
10. Run controls and verify that the results are within specifications.

Flowcell Wash

This function flushes a clogged flowcell and is available from the **Hydraulic Functions** tab.

To wash the perox flowcell, use EZ KLEEN.

To wash the RBC/baso/retic flowcell, use a 25% solution of household bleach and water.

To wash both flowcells at the same time, use EZ KLEEN.

1. Select **Flowcell Wash** to select it.
2. Select the flowcell you want to wash by clicking an option in the Flowcell Options area.
 - Perox Flowcell
 - RBC/Baso/Retic Flowcell
 - Both
3. Hold a tube of EZ KLEEN (perox flowcell) or bleach (RBC/baso/retic flowcell) under the open-tube sampler probe.

 IMPORTANT
 Do not push the aspirate plate.
4. Select **Start** to begin the flowcell wash. Continue to hold the tube under the probe until you hear a beep and the wash block starts to move down (approximately 100 seconds).

 You can select Cancel to stop the flowcell wash. It will stop at the end of the current cycle.

Cleaning the Flowcells on the Analyzer

This method of cleaning the flowcells bypasses the shear valve and the UFC pathways.

- Materials required
- Beaker
- Household bleach

Time: 10 minutes

Analyzer mode: Ready to Run



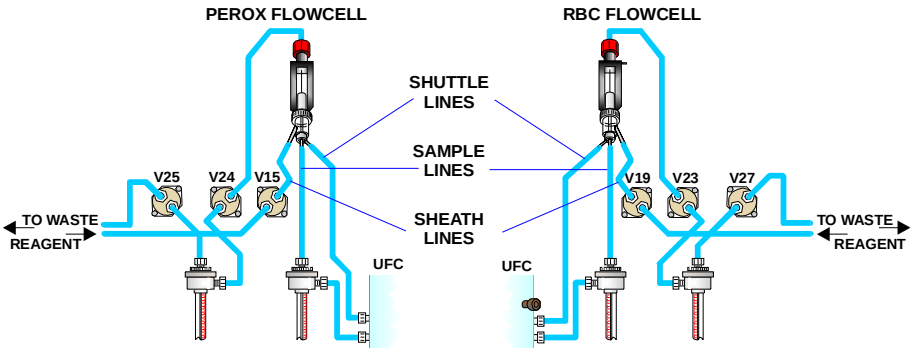
BIOHAZARD

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The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2nd edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

To clean the perox or RBC flowcell without removing it from the analyzer

There are three tubes associated with each flowcell. Typically, only the sample line is cleaned. The rinse and shuttle lines can be cleaned in the same way.



1. Disconnect the sample tubing from the sample syringe and place the end into a beaker of 25% solution of household bleach.
2. At the Utilities menu, select the **Exerciser** tab and select **Valves** from the list on the left.

 If you are cleaning the RBC flowcell, select **V23** and **V27**.

 If you are cleaning the perox flowcell, select **V25** and **V24**.
3. Allow alternate segments of air and bleach solution to be pulled through the sample line.
4. Put water into a beaker and flush the line clean by allowing water to be pulled through the line.
5. Replace the sample line and close all valves.
6. To clean the sheath or shuttle lines, follow the same procedure.

 When cleaning the sheath line, remove tubing from V15 for the perox sheath line or V19 for the RBC sheath line.

 When cleaning the shuttle line, remove the tubing from the UFC fitting.

Cleaning the Flowcells off the Analyzer

Clean the flowcell:

- When there is a clog in the flowcell or in the Concentric Flow Module (CFM)
- When the flowcell windows are dirty

Materials required:

- ADVIA OPTIpoint
- ADVIA TESTpoint controls
- EZ KLEEN, PN T01-3624
- Flowcell Cleaning Kit, PN 113-B711-01

 Kit includes:

- Drill bit
- Needle cleaning kit, PN 113-B911-01
 - Coupling
 - Disposable syringe
 - Luer adapter
- Pin vise

- Household bleach
- Lens tissue
- One 6 inch (15.2 cm) length of 0.020 inch (0.5 mm) ID C-Flex Tubing, PN 562-3052P02
- Spectrophotometric-grade methanol
- Two 50 mL beakers

Syringe preparation

Time: Replacement - 10 minutes
Checkout - 30 minutes

Analyzer mode: Standby



BIOHAZARD

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IMPORTANT
An inspection scope must be available for this procedure. Do not remove the flowcells unless you are trained in how to align and focus them.

To remove and clean the flowcells

1. Remove the flowcell. There is a different procedure for each flowcell.
2. Take the flowcell apart.
3. Clean the CFM.
4. Flush the flowcell and the CFM.
5. Clean the glass windows of the flowcell.

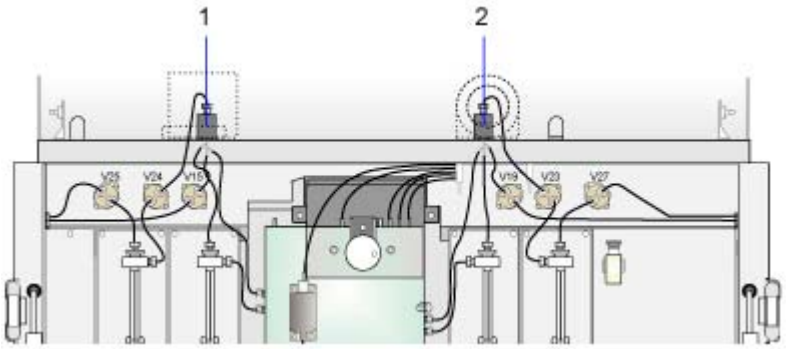
6. Replace the flowcell.
7. Check analyzer performance.

See below for detailed steps.

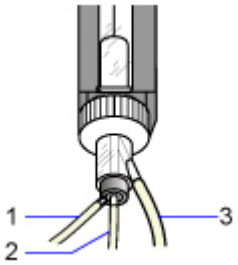
Cleaning the Flowcells off the Analyzer: Step 1 Removing the Perox Flowcell

1. Make sure that the analyzer is in the Standby mode.
2. Open the optics cover. The perox flowcell is on the left.

 Perox flowcell (**1**), RBC flowcell (**2**)

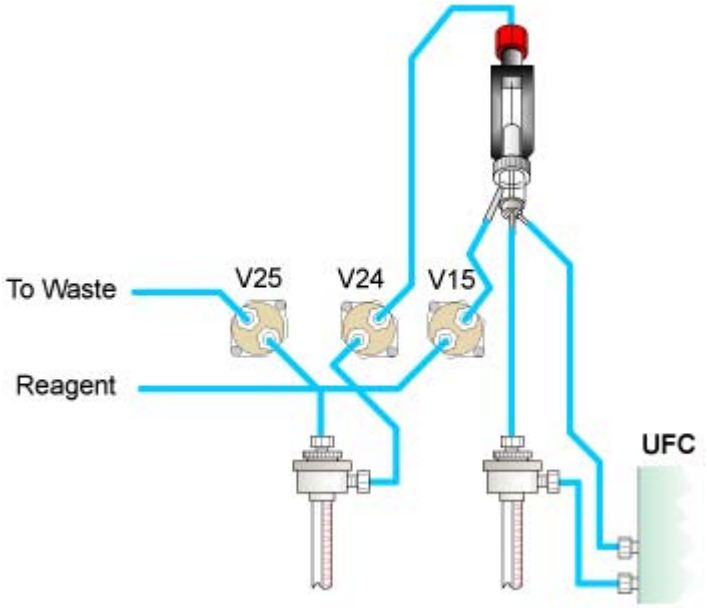


3. Disconnect the shuttle line (**1**), the sample-stream input line (**2**), and the sheath-stream input line (**3**) from the CFM. Allow these lines to hang freely.



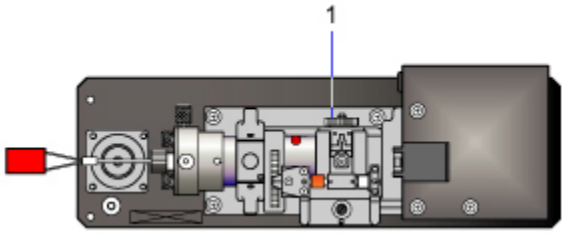
1 SHEATH NIPPLE
2 SAMPLE NIPPLE
3 SHUTTLE NIPPLE

4. Locate hydraulic valve # 24 Unscrew the threaded fitting from the top right side of the valve.

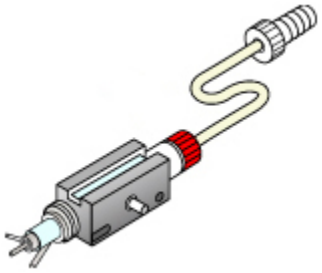


5. Release the flowcell by loosening the release knob located on the right of the flowcell adjustment assembly

 Flowcell release knob (**1**) ⟶ Front of analyzer



6. Hold the flowcell by the red threaded fitting located at the top of the flowcell, then gently lift the flowcell out of the optics assembly.



CAUTION

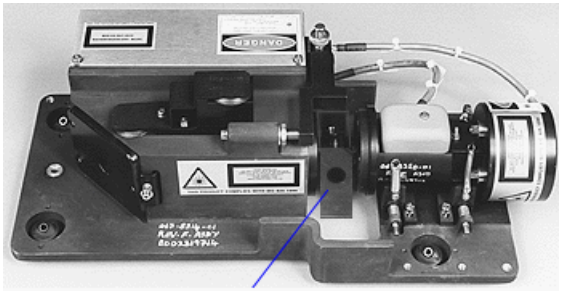
To avoid getting fingerprints on the glass windows of the flowcell, always hold the flowcell by the metal slides.

Cleaning the Flowcells off the Analyzer: Step 1 Removing the RBC/BASO/Retic Flowcell

Before you begin the cleaning of the RBC/baso/retic flowcell, read all laser safety precautions.

WARNING

To avoid possible injury that may occur from laser radiation, do not remove the laser safety shield. You *must not* remove the flowcell if the laser safety shield is not in place on the laser optics assembly.



LASER SAFETY SHIELD

DO NOT REMOVE!

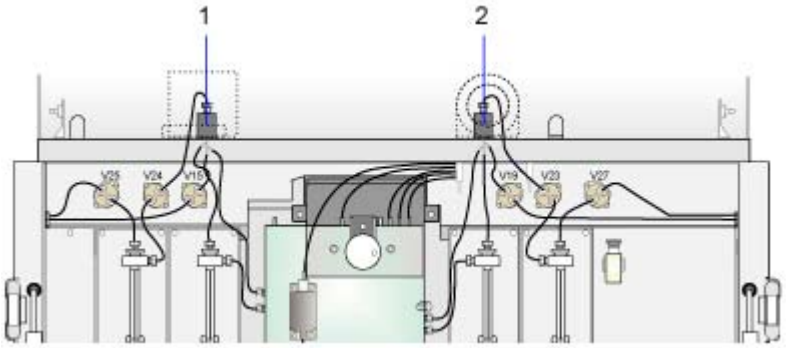
LASER WARNING

To avoid damage to the eyes, never look directly at the laser beam or at its reflection from a shiny surface. All field service procedures must be followed precisely. Only Siemens-trained field service personnel should perform procedures related to laser assemblies.

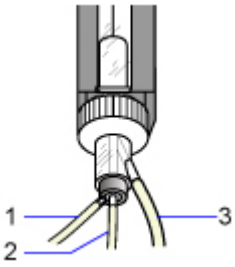
For more safety information and laser specifications, refer to **Safety Information, Protecting yourself from lasers**.

1. Make sure that the analyzer is in the Standby mode.
2. Open the optics cover. The RBC flowcell is on the left.

 Perox flowcell (**1**), RBC flowcell (**2**)

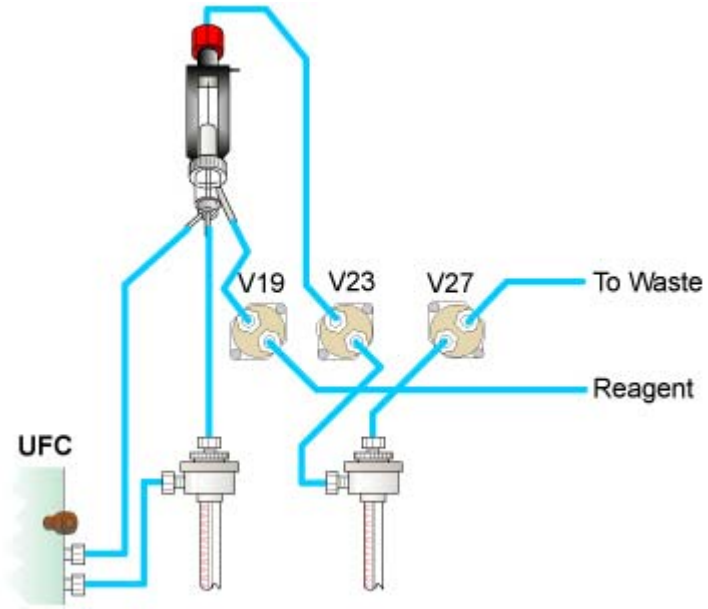


3. Disconnect the shuttle line (**1**), the sample-stream input line (**2**), and the sheath-stream input line (**3**) from the CFM. Allow these lines to hang freely.



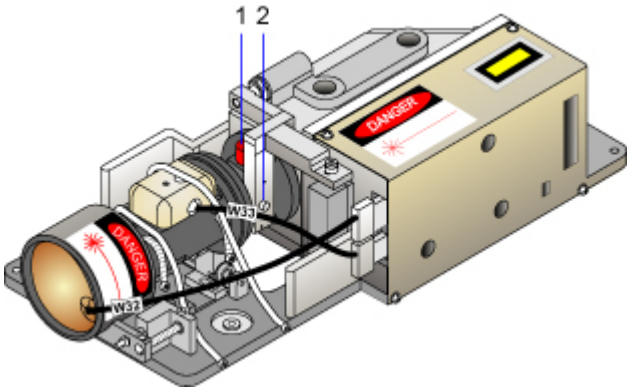
1 SHEATH NIPPLE
2 SAMPLE NIPPLE
3 SHUTTLE NIPPLE

4. Locate hydraulic valve # 23. Unscrew the threaded fitting from the top left-hand side of the valve.

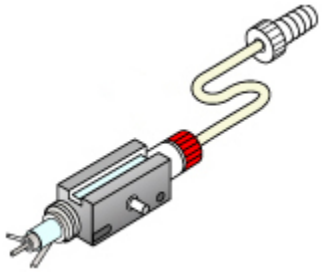


5. Loosen the captive flowcell release screw, then remove the flowcell.

 Flowcell (**1**), flowcell release screw (**2**)



6. Hold the flowcell by the red threaded fitting when lifting the flowcell out of the optics assembly.

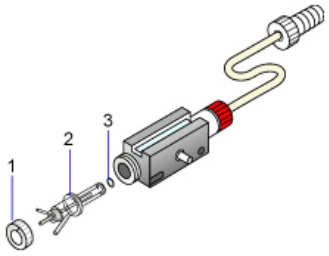


CAUTION

To avoid getting fingerprints on the glass windows of the flowcell, always hold the flowcell by the metal slides.

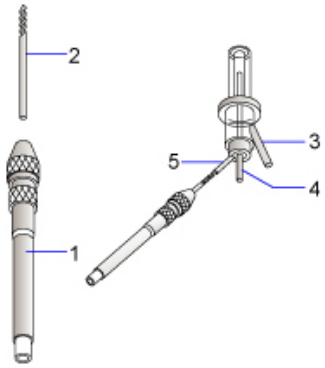
Cleaning the Flowcells off the Analyzer: Step 2 Taking the Flowcell Apart

1. Unscrew the locking nut (**1**) at the input end of the flowcell assembly.
2. Using a twisting motion, remove the CFM (**2**) from the flowcell.
3. Be careful not to lose the O-ring seal (**3**).



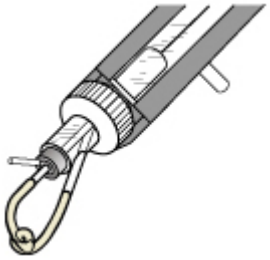
Cleaning the Flowcells off the Analyzer: Step 3 Cleaning the CFM

1. A pin vise (**1**) and a 1/64-inch (0.4 mm) diameter drill bit (**2**) are supplied in the Flowcell Cleaning Kit. Open the pin vise, insert the drill bit approximately 1/4 inch (6.4 mm) into the vise jaws, then tighten the pin vise.
2. Insert the drill bit into the sheath nipple (**3**). Using a twisting motion, carefully push the drill bit through the sheath nipple. If a clog is encountered, proceed slowly while continuing to twist the drill bit.
3. Repeat step **2** for the sample input nipple (**4**).
4. Carefully insert the bit into the shuttle nipple (**5**) to a depth that just barely leaves the flutes of the bit extended beyond the end of the nipple. Twist the drill bit a few times, then remove it from the nipple.



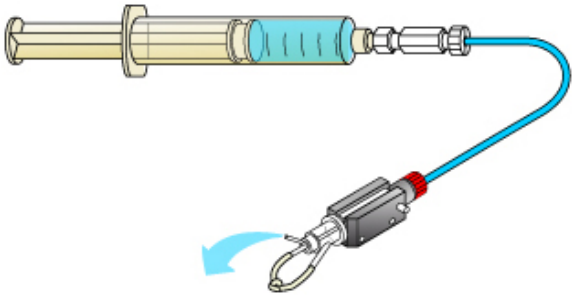
Cleaning the Flowcells off the Analyzer: Step 4
Flushing the Flowcell and the CFM

1. Reattach the CFM to the flowcell assembly. Do not overtighten the locking nut.



2. To flush each nipple separately, the other two nipples have to be blocked off. To do this, knot a piece of 0.020(0.5-mm) ID tubing in the middle of its length. Attach the two ends of the tubing to the nipples that are not being flushed.

3. Draw 10 mL of 25% solution of household bleach and water into the syringe. Connect the syringe and adapter to the flowcell-tube-assembly fitting.



4. Working over a sink, carefully press the plunger to push the contents of the syringe into the flowcell and out the open nipple.

5. Switch one end of the knotted tubing to the cleaned nipple.

6. Disconnect the syringe and the adapter, and draw 10 mL of the appropriate fluid into the syringe. Flush the flowcell with the fluid now exiting through the second nipple.

7. Repeat the flushing for the third nipple

8. Repeat steps **2** through **7** using water to rinse out the flowcell and the CFM.

9. Disconnect the syringe and adapter from flowcell tube assembly fitting.

Cleaning the Flowcells off the Analyzer: Step 5
Cleaning the Glass Windows of the Flowcell

1. Fold a piece of lens tissue so that one edge is slightly narrower than the optical glass window.

CAUTION

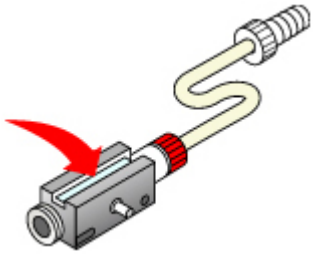
To avoid getting material from your hands onto the optical surfaces (glass windows), do not touch the area of lens paper that will come in contact with the glass windows.

2. Soak this edge of the tissue paper with methanol.

CAUTION

Since impure methanol can leave a film on the windows, use only uncontaminated spectrophotometric-grade methanol.

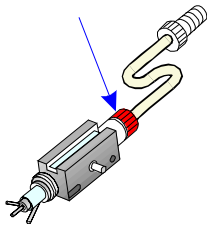
3. Gently wipe one glass surface. Discard the used piece of lens tissue. To prevent formation of a methanol film, completely dry the glass using a clean piece of lens tissue.



4. Examine the clean surface. If the window is not clean enough, repeat steps **1** through **3**.
5. Repeat steps **1** through **4** for the other optical window.

Cleaning the Flowcells off the Analyzer: Step 6
Replacing the Flowcell

1. Hold the flowcell by its red threaded fitting and place it gently into the optics assembly.



2. **Perox optical assembly**

 Tighten the release knob to lock the flowcell into position.

 RBC/baso/retic optical assembly

 Place the flowcell onto the guide pins. Make sure that the flowcell is on both guide pins. The flowcell will be at a 4° angle. Tighten the flowcell release screw.

3. Reconnect the hydraulic lines to the CFM. Reconnect the flowcell tube assembly fitting to the appropriate hydraulic valve (V24 and V23). Hand tighten the connection enough to prevent leaks.

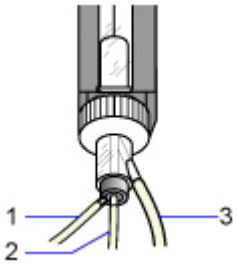
 IMPORTANT
 To avoid incorrect patient data, make sure that each hydraulic line is attached to the correct CFM nipple.

Shuttle line from UFC assembly (**3**)

Sample line from syringe (**2**)

Sheath line from hydraulic valve (**1**)

V15 - perox or V19 - RBC



Cleaning the Flowcells off the Analyzer: Step 7 Checking Analyzer Performance

IMPORTANT

An inspection scope must be available for this procedure. Do not remove the flowcells unless you are trained in how to align and focus them.

1. Bring the analyzer to the **Ready to Run** mode.
2. At the Operations menu, select **Startup**, select **Refresh**, and verify the background count.
3. Check the flowcell connections for leaks.
4. Check the focus and alignment of the flowcell.
5. Check the gains.
6. Run a whole-blood primer, then run controls to verify analyzer performance.
7. If the control results are acceptable to the laboratory, no additional action is required and normal operation can be resumed.

Backflushing the Perox Flowcell and Shuttle and Reaction Chambers

Materials required:

- Flowcell cleaning kit, PN 113-B711-01
- EZ KLEENBeaker
- Deionized water

Analyzer mode: Ready to Run

BIOHAZARD

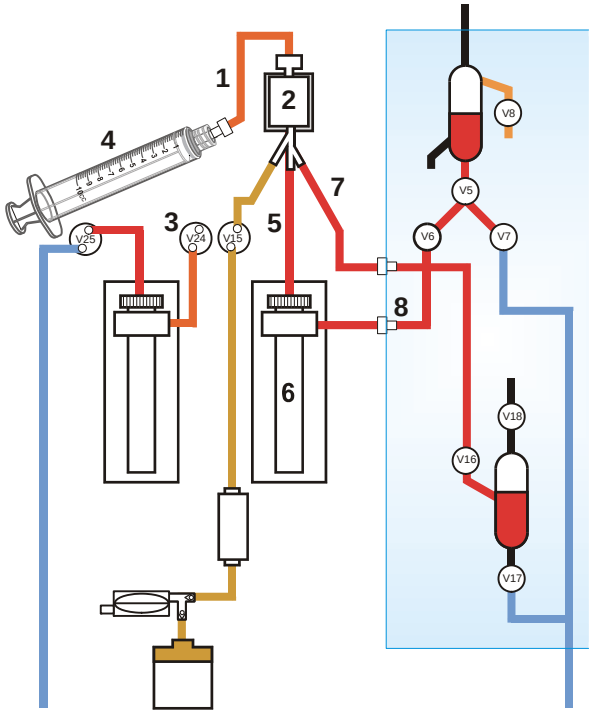
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The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2nd edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

CAUTION

When performing this procedure, do not use force on the syringe at any time.

1. At the Utilities menu, select **Exerciser** to open the Exerciser tab.
2. Disconnect the waste tubing (**1**) that comes from the Perox flowcell (**2**) at V24. This is the white fitting at V24 (**3**).
3. Fill the cleaning syringe (**4**) EZ KLEEN and attach it to the white fitting. Refill the syringe EZ KLEEN as needed during the following steps.
4. Disconnect the sample tubing (**5**) from the top of the sample syringe (**6**) and place the sample tubing into a beaker to catch fluid as you backflush the flowcell
5. Gently push the plunger on the cleaning syringe to flush the EZ KLEEN through the Perox flowcell (**2**). Repeat with deionized water.
6. Reattach the sample tubing (**5**) to the top of the sample syringe (**6**)



7. Refill the syringe with EZ KLEEN.
8. Disconnect the shuttle line (**7**) from the side of the UFC (**8**) and place the sample tubing into a beaker to catch fluid as you backflush the flowcell.
9. Gently push the plunger on the cleaning syringe to flush the EZ KLEEN through the Perox flowcell (**2**). Repeat with deionized water.
10. Reattach the shuttle line (**7**) to the side of the UFC (**8**).
11. Refill the syringe with EZ KLEEN.

12. At the Valves window of the **Exerciser** tab, open V16 and V17 and then push the syringe to push EZ KLEEN through the shuttle pathway to the VSC chamber. Repeat with deionized water and then close V16 and V17.
13. Refill the syringe with EZ KLEEN.
14. At the Valves window of the Exerciser tab, open V5 and V6. Remove the cap from the Perox chamber (**9**) and then push the syringe to fill the chamber. When the chamber is full, open V7 to drain it. Close V7. Repeat with deionized water and then close V5, V6, and V7.
15. Remove syringe (**4**) from the white fitting.
16. Reattach the line to the fitting on V24 (**3**).
17. Select the **Analyzer Status** tab to exit the Exerciser.
18. Open the **Hydraulic Functions** tab and then perform one System Wash cycle.
19. Run controls to verify system performance.

Backflushing the RBC/baso/retic Flowcell and Shuttle and Reaction Chambers

Materials required:

- Flowcell cleaning kit, PN 113-B711-01
- EZ KLEENBeaker
- Deionized water

Analyzer mode: Ready to Run

 **BIOHAZARD**

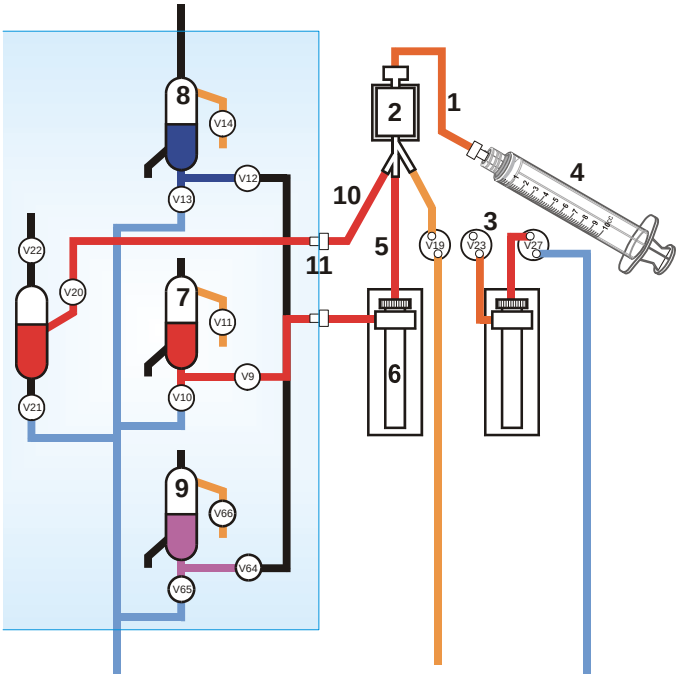
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 **CAUTION**

When performing this procedure, do not use force on the syringe at any time.

1. At the Utilities menu, select **Exerciser** to open the Exerciser tab.
2. Disconnect the waste tubing (**1**) that comes from the RBC flowcell (**2**) at V23. This is the white fitting at V23 (**3**).
3. Fill the cleaning syringe (**4**) 25% household bleach solution and attach it to the white fitting. Refill the syringe with bleach solution as needed during the following steps.



4. Disconnect the sample tubing (**5**) from the top of the sample syringe (**6**) and place the sample tubing into a beaker to catch fluid as you backflush the flowcell.
5. Gently push the plunger on the cleaning syringe to flush the bleach solution through the RBC flowcell (**2**). Repeat with deionized water.
6. Reattach the sample tubing (**5**) to the top of the sample syringe (**6**).
7. Refill the syringe with bleach solution.
8. At the Valves window of the Exerciser tab, open V9 and then push the syringe to fill RBC chamber (**7**) with 25% bleach, then open V10 to drain. Close V9 and V10. Repeat with deionized water.
9. Refill the syringe with bleach solution.
10. In the **Valves** window of the **Exerciser** tab, open V12 and then push the syringe to fill Baso chamber (**7**) with bleach solution, then open V13 to drain. Close V12 and V13. Repeat with deionized water.
11. Refill the syringe with bleach solution.
12. At the Valves window of the Exerciser tab, open V64 and then push the syringe to fill Retic chamber (**7**) with bleach solution, then open V65 to drain. Close V64 and V65. Repeat with deionized water.
13. Disconnect the shuttle line (**10**) from the side of the UFC (**11**) and then place the end of the sample tubing into a beaker to catch fluid as you backflush the flowcell.
14. Refill the syringe with bleach solution.

15. Gently push plunger on the cleaning syringe to flush bleach solution through the RBC flowcell (**2**). Repeat with deionized water.
16. Reattach the shuttle line (**10**) to the side of the UFC (**11**).
17. Refill the syringe with bleach solution.
18. At the Valves window of the Exerciser tab, open V20 and 21 and then push the syringe to push bleach solution through the shuttle pathway to the VSC chamber. Repeat with deionized water and then close V20 and V21.
19. Remove syringe (**4**) from the white fitting.
20. Reattach the line to the fitting on V23 (**3**).
21. Select the Analyzer Status tab to exit the Exerciser.
22. Open the **Hydraulic Functions** tab and then perform one System Wash cycle.
23. Run controls to verify system performance.

Repair and Replacement

Replacing the Clot Filters

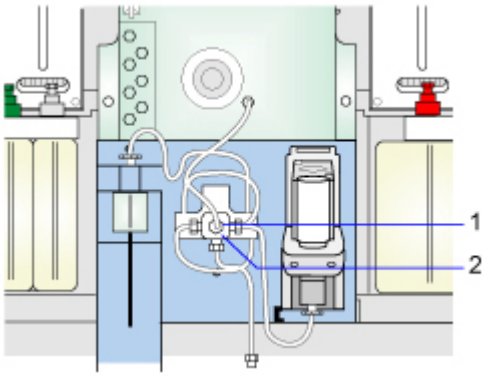
Materials required:

- Lens tissue
- Replacement clot filter, PN 113-3719-01

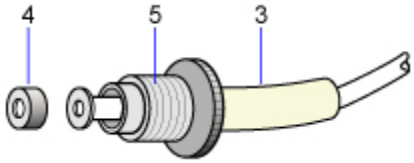
Time: Replacement - 5 minutes

Checkout - 5 minutes

Analyzer mode: Standby



1. Unscrew the fitting and tube assembly (**1**) from the front of the selector valve (**2**).



2. Gently push the silicone sleeve (**3**) to release the clot filter (**4**) from the filter adapter fitting (**5**).
3. Visually check the filter adapter fitting and the input port of the selector assembly for any dirt or small particles.
4. If you find some debris, use a piece of lens tissue moistened with water to remove it.

5. Wet the new clot filter with water and place it into the filter adapter fitting. Orientation of the filter is not important.

6. Reconnect the filter adapter fitting to the selector valve. Finger tighten.

 IMPORTANT
 Be very careful not to misthread the fitting. Misthreading could strip the valve which will prevent proper operation.

7. Run a sample and visually check for air bubbles in the sample line between the selector valve and the UFC block.

8. Check aspiration rate.

9. If air bubbles appear, check that the filter adapter fitting is screwed on correctly and that it is finger-tight, then repeat step 7. If air bubbles still appear, disconnect the filter adapter fitting and check for dust or debris in the fitting and in the port.

 If air bubbles still persist, call Siemens technical support.

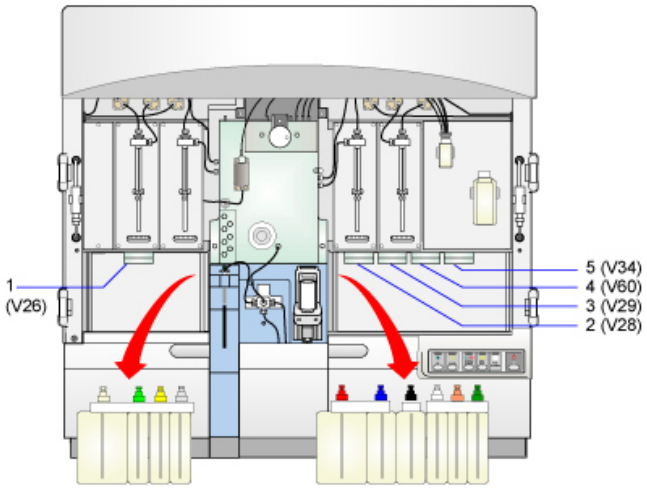
Replacing the Diaphragm Pumps

Time: Replacement - 5 minutes
Checkout - 15 minutes

Materials required:

1	**DP1 - PEROX SHEATH**
2	**DP2 - SHEATH /RINSE**
3	**DP3 - SHEATH /RINSE**
4	**DP4 – WASH** **PN 067-B294-04**
5	**DP5 - SHEATH /RINSE** **PN 067-B294-01**

Analyzer mode: Off



REMOVE BOTTLES TO ACCESS DIAPHRAGM PUMPS

1. Remove the reagent bottles from the side where you are replacing the diaphragm pump.

2. Pull the pump forward until it is released from its keyhole slots.

3. Remove the three tubes, then attach these tubes to the new pump.

4. Insert the raised studs on the top of the pump into the keyholes and push the pump back until it is secure.

5. Replace the reagent bottles.

6. Checkout

 - For all replaced pumps - prime reagent lines and verify that there are no leaks.

- If DP1 is replaced, run two saline primers. At the Operations menu, select the Startup tab. Select **Refresh** and verify that the WBC background count is 0.1 or less (1000 cells/µL).
- If DP4 is replaced, do a system wash and verify that the reaction chambers are filling up with wash solution to their normal wash levels.
- If DP5 is replaced, run two saline primers. At the Operations menu, select the Startup tab. Select **Refresh** and verify that the platelet background count is 5 or less (1000 cells/µL).

 If required, run additional saline samples until acceptable background counts are obtained for two consecutive samples. If more than five saline samples are required, verify that the pump was installed properly.

7. Run controls to verify analyzer performance.

Replacing the Drain Filters

If the filter is not clogged but you want to clean it because of heavy buildup or discoloration, use the backflush procedure.

Time: 10 minutes

Analyzer mode: Off

WARNING

The analyzer *must* be off; otherwise, personal injury from the needle may occur.

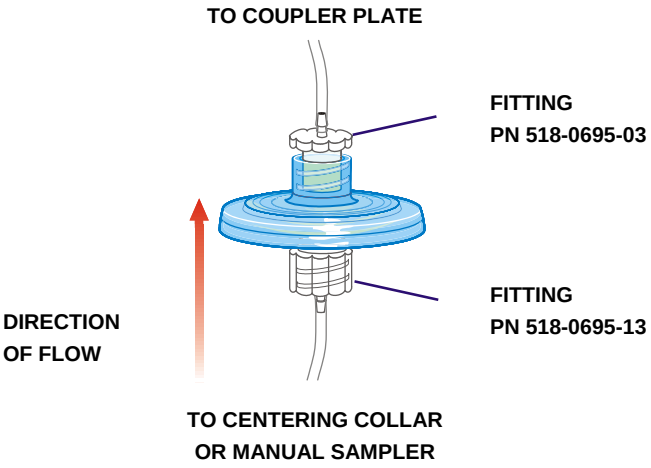
BIOHAZARD

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1. Turn the analyzer off.
2. Unscrew the old filter from both fittings. Discard the old filter.
3. Connect the new filter to the fittings and hand tighten them to ensure they are sealed.

4. Turn the analyzer on and run samples in the manual and autosampler modes. Check to ensure that there are no leaks and that fluid passes through the filters properly. Make sure that the lines do not interfere with autosampler aspirator motion.



Replacing a Perox Check Valve

Time: Installation and Checkout - 15 minutes

Materials required: Check valve, PN 556-1190-01

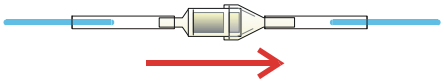
Analyzer mode: Standby

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1. Remove the old check valve from the Perox line.
2. Install the check valve into the line with the direction of flow toward the reagent pump and away from the reagent bottle, as shown by the red arrow in the figure to the right. Make sure not to damage the tube sleeve on the valve.



3. Prime the reagent lines. Visually verify that the lines are priming.
4. Run controls.

Replacing the Front Shear Face or the Shear Valve Rotor

Materials required:

- ADVIA TESTpoint controls
- Calibrators (as required)
- Front shear valve face, PN 067-0558-01
- Shear-valve rotor, PN 067-0876-01
- Whole blood

Time: Replacement - 5 minutes
Checkout - 15 minutes

Analyzer mode: Standby



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To remove and replace the front shear valve face or the shear-valve rotor

In the maintenance procedure, **Cleaning the Shear Valve**

- Go to **Step 1** to take the shear valve apart.
- Go to **Step 3** to reassemble the shear valve with the new part.

To check analyzer performance

- At the Operations menu, select the **Startup** tab and verify background counts.
- Run a whole blood primer.
- Run controls. If controls do not recover, calibrate the affected channel.

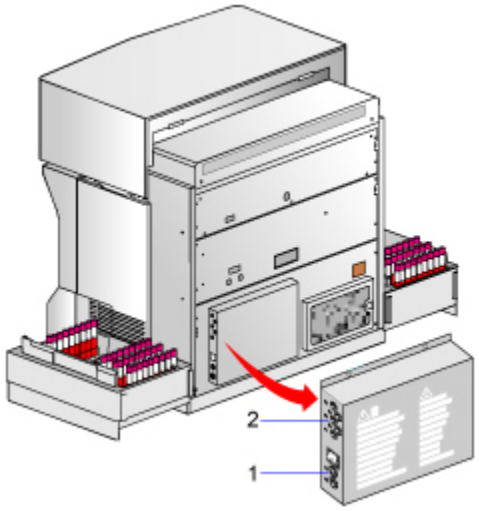
Replacing the fuses

IMPORTANT
All fuses must be replaced with same rated fuses.

Materials required: Flat-head screwdriver

Fuse ratings and part numbers:

FUSE APPLICATION			FUSE RATINGS	
FUSE NO.	DEVICE PROTECTED	TYPE	100 V 120 V SYSTEMS	220 V 230 V 240 V SYSTEMS
F1	AC Input (L1)	3 AB	15.00A (T) 250V PN625-0073-03	8.00A (T) 250V PN625-0073-02
F2	AC Input (L2)	3 AB	15.00A (T) 250V PN625-0073-03	8.00A (T) 250V PN625-0073-02
F3	Computer/Monitor at J24 and J25	20mm	6.30A (T) 250V PN 625-0127-11	3.15A (T) 250V PN 625-0127-10
F4	Power Supply PS1 +5V	20mm	0.50A (T) 250V PN625-0127-09	0.25A (T) 250V PN 625-0127-07
F5	Power Supply PS4 +5V Perox Lamp and ±15V	20mm	2.00 A (T) 250V PN 625-0127-04	1.00A (T) 250V PN 625-0144-03
F6	Power Supply PS2 +24V	20mm	4.00A (T) 250V PN 625-0127-05	2.00A (T) 250V PN 625-0127-04
F7	Power Supply PS3 +5V and ±12V	20mm	3.15A (T) 250V PN 625-0127-10	1.60A (T) 250V PN 625-0127-06



Both main fuses, F1 and F2, must be replaced if either one is blown.

Location:
Two main fuses, **F1** and **F2** (**1**); fuses **F3** through **F7** (**2**)

Analyzer mode: Off, power cord unplugged

To replace the 20-mm fuses (F3 through F7)



1. Loosen the fuse holder by turning it counterclockwise.
2. Pull out the fuse holder, then remove the faulty fuse.
3. Insert the new fuse, slide the fuse holder in, and tighten it by turning it clockwise.
4. Plug in the power cord and set the power switch to **I** (on).

To replace main fuses (F1 and F2)

NOTE
Both fuses must be replaced.

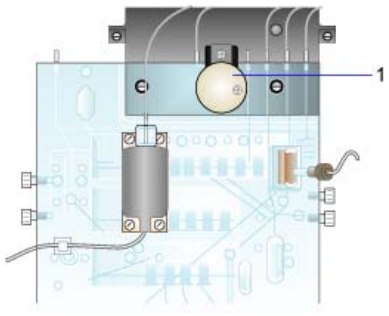
1. With a screwdriver, loosen the fuse cap by turning it counterclockwise.

2. Remove the fuse cap and replace the fuse.
3. Install the fuse cap and tighten it by turning it clockwise.
4. Plug in the power cord and set the power switch to **I** (on).

Replacing the Hemoglobin Colorimeter Lamp

When to replace the lamp:

- If there is an HGB-PL error.
- If it is burned out.
- If the baseline value falls below 2.5.
- If the baseline value cannot be adjusted to between 3.0 and 4.1 volts.
- If indicated during troubleshooting.



When to adjust the baseline value:

- After replacing the lamp.
- If the baseline value is >4.2 volts.
- If indicated during troubleshooting.

WARNING

Avoid burns. Allow enough time for the hemoglobin lamp to cool. After power is shut off, wait at least 5 minutes before removing the lamp.

Materials required:

- ADVIA TESTpoint controls
- Calibrators, as required
- Hemoglobin colorimeter lamp, PN 113-B413-01
- Hex wrench, 1/16-inch (1.6-mm)
- Phillips-head screwdriver

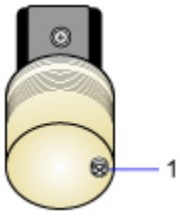
Time: Replacement - 15 minutes
Checkout - 25 minutes

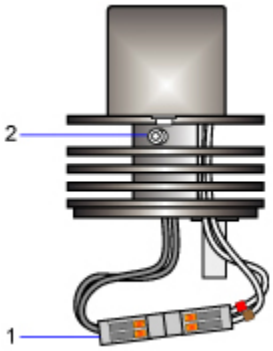
ELECTRICAL WARNING

To avoid exposure to shock hazards and/or damage to the instrument while performing this procedure, power off the analyzer before proceeding.

Analyzer mode: Off

1. Remove the screw (**1**) that secures the lamp adapter cap, then remove the cap. Be careful not to lose the two washers. Keep the hardware and the cap.
2. Disconnect the cables (**2**).
3. Using the hex wrench, loosen the set screw (**3**) to release the old lamp, then remove it.
4. Gently push the new lamp into the housing as far as it will go, then secure it by tightening the set screw.
5. Reconnect the cables. Replace the lamp-adapter cap and secure it with the screw.





6. Turn the analyzer power on. Check that there are no error messages on the Status line relating to hemoglobin colorimeter baseline readings.
7. At the Operations menu, select the **Startup** tab. Select **Refresh** and check the Hgb baseline transmission value (Hgb Trans). If the baseline value is not acceptable, adjust it to 4.1.
8. Run controls to verify analyzer performance. If controls are not acceptable, then recalibrate the hemoglobin channel.

Replacing the Hydraulic Valves

There are six hydraulic valves: three are located below the perox flowcell, and three are below the RBC/baso/retic flowcell.

Materials required:

- Flat-head screwdriver, small
- Hydraulic valve, PN 067-1024-01

Time: Replacement - 10 minutes
Checkout - 15 minutes

Analyzer mode: Off



ELECTRICAL WARNING

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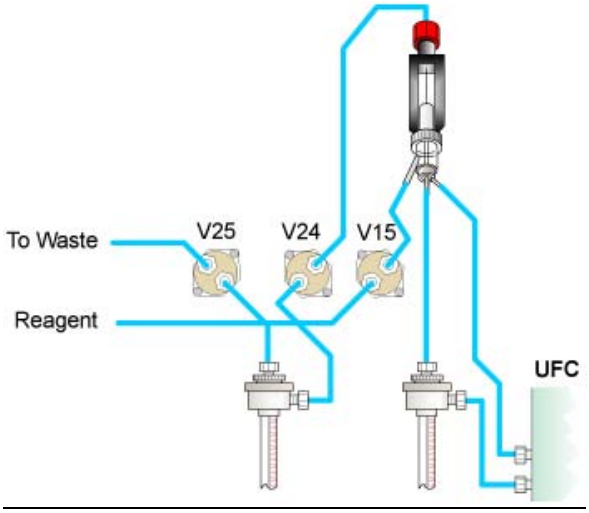
1. Remove the tubing from the ports on the valve fitting, then carefully unscrew the fittings.
2. Remove the two mounting screws. Pull the valve forward until the connector is exposed, then disconnect the cable.
3. Connect the cable of the new valve assembly to the exposed connector on the analyzer.
4. Tuck the cable back into the opening. Mount the new valve, using the two screws saved in step **2**.
5. Replace the fittings. Make sure that they are threaded correctly. Fingers tighten.



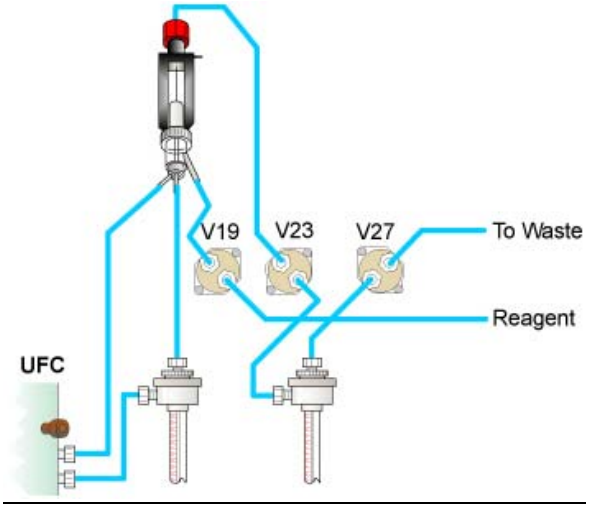
CAUTION

Do not overtighten, or you may cause damage to valve or fittings.

6. Connect tubing.



Perox flowcell connections



RBC flowcell connections

7. Run controls. Check for leaks and verify system performance.

Replacing the Open-Tube Sampler Probe

Materials required:

- Sample probe assembly, PN 113-B646-01
- Scalpel or single-edge razor

Time: Replacement - 10 minutes
Checkout - 15 minutes

Analyzer mode: Off

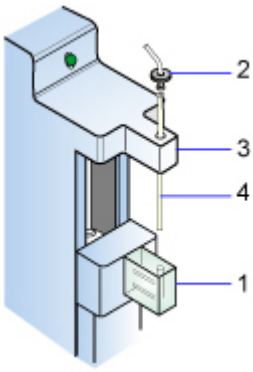
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1. Carefully push the wash block (**1**) down to its fully lowered position.
2. Remove the threaded fitting (**2**) from the probe mount (**3**) by turning it counterclockwise.
3. Carefully slide the probe (**4**) up and out of the probe mount.
4. Discard the probe.
5. Remove the plastic ring and spacer from the replacement probe and discard. Carefully insert the probe through the opening of the probe mount (**3**) and into the opening of the wash block.

 Replace the threaded fitting and finger tighten by rotating it clockwise



6. Check the length of the sample probe and adjust if necessary. (See page 5-3) for instructions.)
7. Before starting to run patient samples again, check operation as follows:

 a. Run several saline primers to verify that there are no leaks, then run a whole-blood primer to verify that the probe is being properly washed after aspiration.

b. Visually check for bubbles in the open-tube sample line.

c. Run enough controls to verify analyzer performance. If control results are not acceptable, check that the probe has been properly installed. If no problem is found, recalibrate the affected channel.

Replacing the Perox Lamp

WARNING

To prevent injury to eyes from shattered glass, wear safety glasses when handling tungsten-halogen lamps.

To avoid severe burns, allow sufficient time for the lamp to cool. After the analyzer is turned off, wait at least 10 minutes.

CAUTION

Fingerprints on the lamp could cause severe degradation in lamp performance.

DO NOT touch the lamp with your fingers.

Material required: Replacement lamp, PN 065-B075-01

Time: Replacement - 20 minutes
Adjustment and checkout - 20 minutes

Analyzer mode: Off, wait at least 10 minutes.

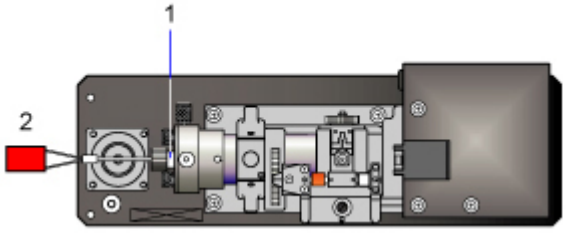
ELECTRICAL WARNING

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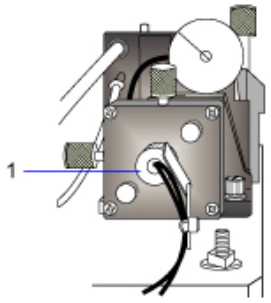
To replace the perox lamp (**1**)

IMPORTANT
Make sure that the power is off before disconnecting the lamp.

1. Disconnect the lamp power connector (**2**) in the back of the perox optics assembly by squeezing the sides of the red connector and pulling it apart.



2. Unscrew the securing cap to which the power cable (**2**) is attached. Carefully pull the lamp assembly out of the optics lamp housing. The lamp assembly includes the lamp, the power cable, and the securing cap. Discard the entire assembly.



VIEW FROM BACK OF PEROX OPTICS ASSEMBLY

3. Insert the replacement lamp assembly.

CAUTION

Do not touch the glass bulb. If necessary, clean with lens paper and methyl alcohol.

4. Replace the securing cap, then connect the red power connector.
5. Turn the analyzer on and align the lamp to maximize its output. (See page 5-4 for instructions.)

Replacing the perox flowcell

Time: Installation - 15 minutes
Checkout - 15 minutes

Analyzer mode: Standby

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2nd edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

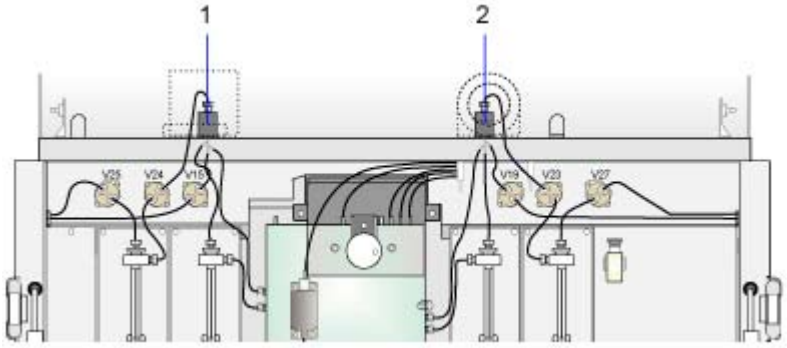
IMPORTANT
An inspection scope must be available for this procedure. Do not remove the flowcells unless you are trained in how to align and focus them.

To remove the flowcell

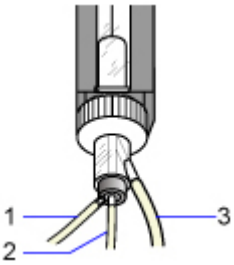
1. Make sure that the analyzer is in the Standby mode.

2. Open the optics cover. The perox flowcell is on the left.

 Perox flowcell (**1**), RBC flowcell (**2**)



3. Disconnect the shuttle line (**1**), the sample-stream input line (**2**), and the sheath-stream input line (**3**) from the CFM. Allow these lines to hang freely.

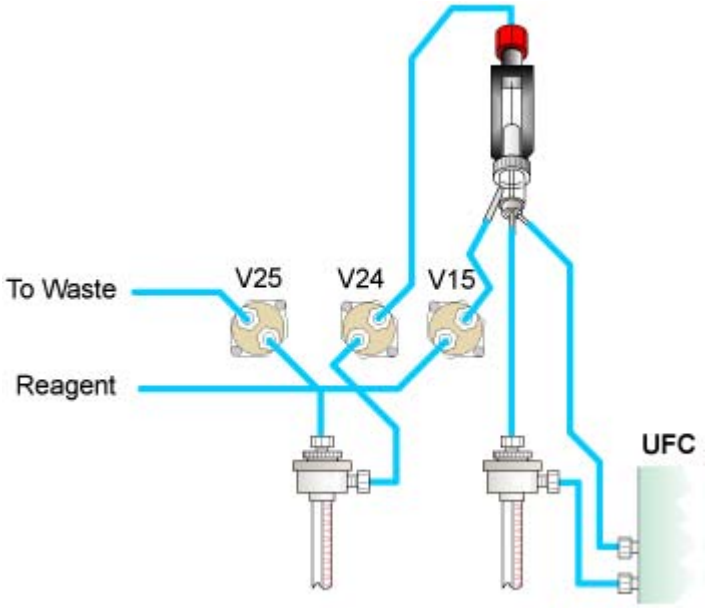


1 SHEATH NIPPLE

2 SAMPLE NIPPLE

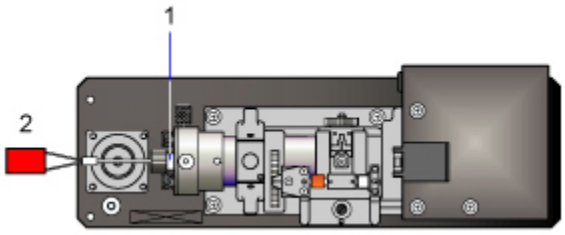
3 SHUTTLE NIPPLE

4. Locate hydraulic valve # 24, Unscrew the threaded fitting from the top right side of the valve.

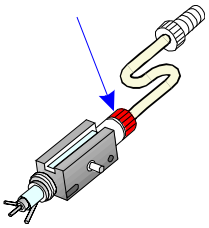


5. Release the flowcell by loosening the release knob located on the right of the flowcell adjustment assembly

Flowcell release knob (**1**) → Front of analyzer



6. Hold the flowcell by the red threaded fitting located at the top of the flowcell, then gently lift the flowcell out of the optics assembly.



CAUTION

To avoid getting fingerprints on the glass windows of the flowcell, always hold the flowcell by the metal slides.

To install the flowcell

1. Hold the flowcell by its red threaded fitting and place it gently into the optics assembly.
2. Tighten the release knob to lock the flowcell into position.
3. Reconnect the hydraulic lines to the CFM. Reconnect the flowcell tube assembly fitting to the appropriate hydraulic valve, V24. Hand tighten the connection enough to prevent leaks.

IMPORTANT
To avoid incorrect patient data, make sure that each hydraulic line is attached to the correct CFM nipple.

To check analyzer performance

1. Bring the analyzer to the Ready to Run mode, then run a saline primer.
2. Check the flowcell connections for leaks and verify saline background on the Startup tab.
3. At the Procedures menu, select the **Align Optics** tab.
4. Select the Info button for help.
5. At the Logs menu, select **Cal/Gain Logs** and check gain factors. Adjust gains if necessary.

6. Run a whole-blood primer, and then run controls to verify analyzer performance.

7. If the control results are acceptable to the laboratory, no additional action is required and normal operation can be resumed.

Replacing the RBC/baso/retic flowcell

Before you remove the RBC/baso/retic flowcell, read all laser safety precautions.

Time: Installation - 15 minutes
Checkout - 15 minutes

Analyzer mode: Standby

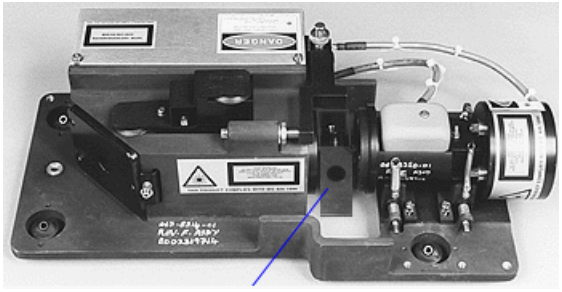
BIOHAZARD

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The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2nd edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

WARNING

To avoid possible injury that may occur from laser radiation, do not remove the laser safety shield. You *must not* remove the flowcell if the laser safety shield is not in place on the laser optics assembly.



LASER SAFETY SHIELD

DO NOT REMOVE!

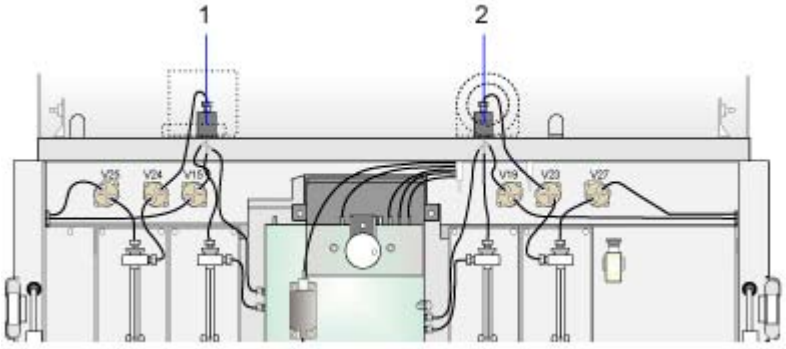
LASER WARNING

To avoid damage to the eyes, never look directly at the laser beam or at its reflection from a shiny surface. All field service procedures must be followed precisely. Only Siemens-trained field service personnel should perform procedures related to laser assemblies.

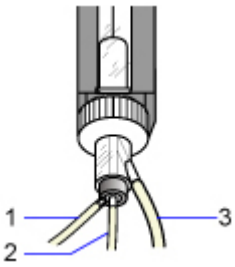
For more safety information and laser specifications, refer to **Safety Information, Protecting yourself from lasers**.

1. Make sure that the analyzer is in the Standby mode.
2. Open the optics cover. The RBC flowcell is on the left.

 Perox flowcell (**1**), RBC flowcell (**2**)

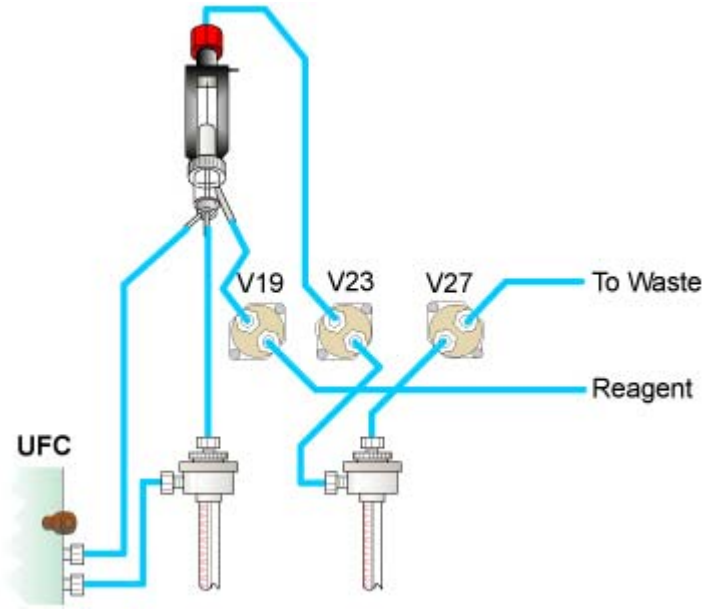


3. Disconnect the shuttle line (**1**), the sample-stream input line (**2**), and the sheath-stream input line (**3**) from the CFM. Allow these lines to hang freely.



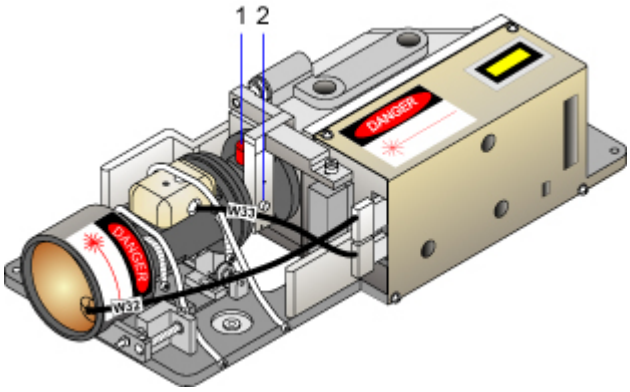
1 SHUTTLE NIPPLE
2 SAMPLE NIPPLE
3 SHEATH NIPPLE

4. Locate hydraulic valve # 23. Unscrew the threaded fitting from the top left-hand side of the valve.

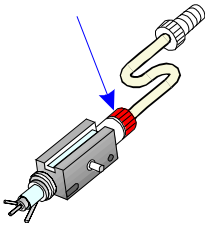


5. Loosen the captive flowcell release screw, then remove the flowcell.

 Flowcell (**1**), flowcell release screw (**2**)



6. Hold the flowcell by the red threaded fitting when lifting the flowcell out of the optics assembly.



CAUTION

To avoid getting fingerprints on the glass windows of the flowcell, always hold the flowcell by the metal slides.

To install the flowcell

1. Hold the flowcell by its red threaded fitting and place it gently into the optics assembly.
2. Place the flowcell onto the guide pins. Make sure that it is resting on both pins. The flowcell will be at a 4° angle. Tighten the captive flowcell release screw to lock the flowcell into position.
3. Reconnect the hydraulic lines to the CFM. Reconnect the flowcell tube assembly fitting to the appropriate hydraulic valve, V234. Hand tighten the connection enough to prevent leaks.

IMPORTANT
To avoid incorrect patient data, make sure that each hydraulic line is attached to the correct CFM nipple.

To check analyzer performance

1. Bring the analyzer to the Ready to Run mode, then run a saline primer.
2. Check the flowcell connections for leaks and verify saline background on the Startup tab.
3. At the Procedures menu, select the **Align Optics** tab.
4. Select the Info button for help.
5. At the Logs menu, select **Cal/Gain Logs** and check gain factors. Adjust gains if necessary.
6. Run a whole-blood primer, and then run controls to verify analyzer performance.
7. If the control results are acceptable to the laboratory, no additional action is required and normal operation can be resumed.

Replacing the syringes

To remove and replace one of the syringes, follow instructions in the Maintenance section, replacing the Syringe Plungers.

Replacing the vacuum pump filter (vacushield)

The vacuum filter traps liquid that would otherwise enter and damage the vacuum pump. Replace this filter if it becomes saturated with liquid.

Materials required:

- Flat-head screwdriver, large
- Paper towels
- Vacushield filter PN 518-3146-01

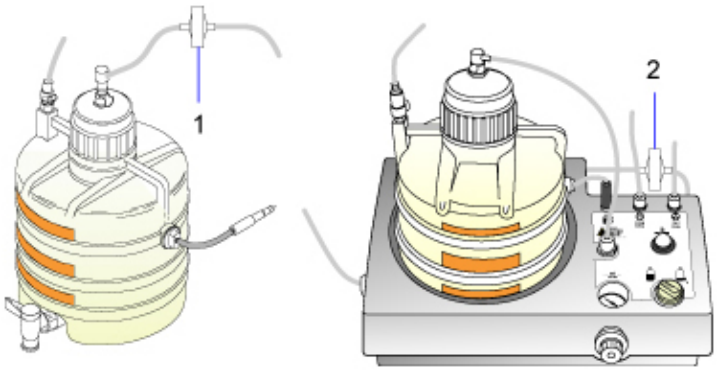
Time:
Replacement - 10 minutes
Checkout - 10 minutes

Analyzer mode: Off

The words **FLUID SIDE** are imprinted on each filter.

Location of the filters:

manual (**1**) and automatic (**2**) waste containers



BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2nd edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

To replace the filter

1. Place paper towels under the filter.
2. Disconnect and discard the filter.
3. Install the new filter.

 IMPORTANT
 The direction of the filter is important. Look for the words FLUID SIDE on the filters and orient the filters in the lines as shown in the figure above.
4. Discard the paper towels.
5. Turn the analyzer power on.

 CAUTION

 To avoid serious damage to the analyzer, you must never turn on the analyzer without the vacushield filter in place.

6. For the manual waste removal, at the Utilities menu select the **Analyzer Status** tab. At the Vacuum and Pressure area, check that the 20 in. Hg reading is between 19 and 21. If required, adjust the 20 in. Hg vacuum regulator knob.

 IMPORTANT
 All pneumatic settings must be reached by turning the knobs in an upward or clockwise direction only. If a reading goes above the target value, turn the knob back and allow the analyzer to equilibrate. The analyzer displays a new reading every five seconds. Adjust upward to the correct value.

 For systems with automatic waste removal, also verify the 20 psi reading. If necessary, adjust the pressure regulator knob.

7. If a 19 to 21 reading cannot be reached, check that the lines to the filter are secure. If you are still having difficulty, call Siemens technical support.

Replacing the wash block

Time: Replacement - 5 minutes
Checkout - 15 minutes

Analyzer mode: Standby



BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2nd edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

1. Remove the sample probe. (See page 5-37 for instructions.)

2. Wait for about two minutes until the vacuum is released from the wash block. Gently move the push-to-aspirate paddle and wash-block assembly down approximately 1 inch (25.4 mm).

3. Support the push-to-aspirate paddle with one hand. With the fingers of your other hand grab the top and bottom of the wash block and gently push down on the block until it slides down about ¼ inch (6.5 mm). Align the tabs on the wash block with the openings on the paddle assembly. Remove the block by gently pulling it straight out.

4. Mark the tubes with tape (the top line is rinse and the bottom line is vacuum), then remove the lines. Be careful not to allow the tubes to fall behind the aspirate paddle assembly. If necessary, use hemostats to hold the tubing outside the assembly.
5. Connect the lines to the new block.
6. Install the block onto the aspirator assembly by aligning the tabs with the appropriate slots. Push the block into the assembly and gently slide the block upward until it clicks into place. Be careful that you do not pinch the wash or vacuum line during the installation process.
7. Check the length of the probe. (See page 5-3 for instructions.)
8. Run several saline samples and verify that there are no leaks or bubbles in the sample line.
9. Run a whole blood primer to verify that the probe is being properly washed and dried after aspiration.
10. Run controls to verify analyzer performance.

Troubleshooting Tips

Autosampler Troubleshooting Tips

“Eject rack” or “Rack in sampler” status line error messages appear when the analyzer is powered off then turned on again.

To avoid autosampler errors, you should wait for the following two status-line messages to appear before you turn the power on again:

“Communication error with analyzer.”

“Analyzer/computer not connected.”

There is leakage at the sample fitting on the centering collar.

Finger-tighten the fitting about 1½ turns, then use a 7/32-inch (6-mm) open-end wrench to tighten the fitting another 1/8 turn.

The error message “Input queue gate open” appears occasionally when starting the autosampler.

This error appears sometimes when a rack is waiting in the input shuttle area. Move the rack back to the first position in the tray and start the autosampler again.

Cannot Find Videos

"Cannot find the videos_op\videos_op.hlp Help file. Check to see that the file exists on your disk. If it doesn’t, you need to reinstall it."

If you get this message when trying to view the videos and you have recently installed a Zip drive, the letter assigned to your CD-ROM drive may have changed.

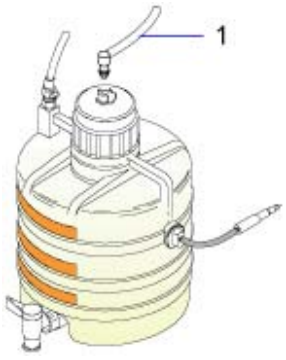
Reinstall the Operator’s Guide. The installation process will reset the correct path to the videos.

Checking Drain Filters for Clogs

See Replacing the Drain Filters on page 5-27.

Compressor Does Not Start

In cases when the analyzer is turned off and restarted too quickly, the compressor may not start up, causing the system initialization to fail. This is due to residual vacuum in the waste container. The operator must manually vent the container.



To manually vent either container (manual or autowaste), disconnect the waste container vacuum line (**1**), wait for the vacuum to dissipate, and then reconnect the line.

Data Manager and LIS

At the host computer, how can I tell controls apart?

In the SID that is sent to the host, the first two digits after the C identify the control as follows:

Control Type	First Digit	Second Digit
CBC/DIFF	1	1, 4, or 7 = Low 2, 5,or 8 = Normal 3, 6, or 9 = High
RETIC	2	1, 3, or 5 = Low 2, 4, or 6 = High

How many 3.5" floppy disks does it take to back up 10,000 All Complete samples?

It takes approximately 14 disks and 1.5 hours. To save time, you should do an All Complete backup every day. During an All Complete, the system will back up only those records that were added since the last backup. The system warns you when it is almost full. The default warning appears at 9800 samples and can be changed in Customer Parameters. Since the system cannot operate with more than 10,000 records in the database, once the database nears 9000 records you should purge the oldest 500 or 1000 records every day. This will make room for the next day's samples. In Customer Parameters, you also have the option to set All Complete file size to trigger purge, which will automatically purge records when you perform the End of Day procedure.

Why does the LIS link indicator on the Sample Cont. Panel remain green when the host-computer cable is disconnected from my PC?

The bi-directional protocol communication link sensor is time-delayed. After you disconnect the cable, it takes from 30 to 60 seconds for the LIS link indicator to turn red. If, however, you attempt to send information to the host computer before this time has elapsed, the indicator will turn red immediately.

If your system is set up for monodirectional protocol, the LIS link indicator works differently. After you turn on the host communication, the indicator stays red until you send the first sample. Once you send the sample, the indicator turns green and stays green even after you disconnect the host computer cable from your PC.

No Sound When Viewing Videos

If there is no sound when you are viewing a video, adjust the sound on your monitor. Refer to the instructions in the manual shipped with the monitor you are using.

There is no sound with animations.

Perox Chamber

PEROX 3 reagent is used up before PEROX 2 reagent bottle is empty.

Perox reaction chamber overflows

- Check for blockage in the perox reaction chamber cap. Clear any blockage using a drill bit or a paper clip.
- Check for blockage or crimps in the perox overflow tube.
- Make sure that the ends of the tubes do not touch the bottom of the overflow bottle nor are they submerged in liquid.

NOTE
If the opening on overflow-bottle cap is not large enough and pinches the tubes, cut the rubber cap from the outside edge to the inner opening to relieve some of the pressure on the tubes.

Flags

MORPHOLOGY FLAGS 3

SUMMARY 3
ANISOCYTOSIS (ANISO) 4
ATYPICAL LYMPHOCYTES (ATYP) 5
BLASTS (BLASTS) 6
HGB CONCENTRATION VARIANCE (HCVAR) 8
HYPERCHROMIA (HYPER) 8
HYPOCHROMIA (HYPO) 9
IMMATURE GRANULOCYTES (IG) 10
LARGE PLATELETS (LPLT) 11
LEFT SHIFT (LS) 12
MACROCYTOSIS (MACRO) 13
MICROCYTOSIS (MICRO) 14
MYELOPEROXIDASE DEFICIENCY (MPO-D, MO) 15
NUCLEATED RED BLOOD CELLS (NRBC) 16
PLATELET CLUMPS (PLT-CLM, NW) 17
RBC FRAGMENTS (RBCF) 18
RBC GHOSTS (RBCG) 19

SAMPLE/SYSTEM FLAGS 21

SUMMARY 21
BASO COUNT SUSPECT (B-SUSP, BC) 25
BASO IRREGULAR FLOW RATE (BIFR, BR) 26
BASO NOISE (B-NO, NB) 27
BASO NO VALLEY (B-NV, VB) 28
BASO SATURATION (B-SAT, BS) 29
BASO TEMPERATURE OUT OF RANGE (BTO, TB) 30
COMPARISON ERROR MCHC / CHCM (CHCMCE, CC) 31
COMPARISON ERROR WBCB/WBCP (WBC-CE, WC) 32
HGB IRREGULAR FLOW RATE (HGBIFR, HR) 32
HGB POWER LOW (HGB-PL, PH) 33
LASER POWER LOW (LAS-PL, PL) 33
NO PEROX NRBC / LYMPH VALLEY (NRPXNV, NV) 34
PEROX IRREGULAR FLOW RATE (PXIFR, XR) 34
PEROX NO VALLEY (PX-NV, VX) 35
PEROX NOISE (PX-NO, NX) 36
PEROX POWER LOW (PX-PL, PX) 38
PEROX SATURATION (PX-SAT, XS) 38
PEROX TEMPERATURE OUT OF RANGE (PXTO, TX) 40
PLATELET NOISE (PLT-NO, NT) 40
PLATELET ORIGIN NOISE (PLTORN, OT) 41
RBC IRREGULAR FLOW RATE (RBCIFR, RR) 41
RETIC – PLT INTERFERENCE ERROR (RTCINT, CT) 42
RETIC ABSORPTION DISTRIBUTION ABNORMAL (RTCADA, CA) 43
RETIC ABSORPTION FLATNESS (RTC-FL, RF) 44
RETIC FIT SUSPECT (RTC-FS, FC) 45
RETIC IRREGULAR FLOW RATE (RTCIFR, CR) 45
RETIC NOISE ORIGIN (RTC-NO, NO) 46
RETIC RBC COUNT LOW (RTC-L, CL) 47
RETIC SATURATION (RTCSAT, CS) 47

RETIC SLOPE ERROR (RTC-SE, SE) 48
SUSPECT CELLULAR INTERFERENCE (NRCELL, NC) 49
SUSPECT LARGE PLT INTERFERENCE (NRLPLT, NP) 50
SUSPECT LIPID INTERFERENCE (NR-LPD, NL) 50
WBC SUBSTITUTION (WBCSUB, WS) 51

Morphology Flags

Summary

Laboratory personnel are alerted to suspected sample abnormalities through the combined use of morphology and quantitative flags (high and low). ADVIA 2120/2120i morphology flags are derived from a series of complex algorithms. These algorithms are based on the identification of conditions surrounding the presence of abnormalities.

For a description of result rounding, please see Calculation of Results in the Regulatory Information Section of this manual.

The ADVIA 2120/2120i system does not enumerate abnormal cells. Despite a high degree of sensitivity and specificity in detecting conditions consistent with the presence of abnormal cells, test results produced by the ADVIA 2120/2120i system are intended for laboratory use only. Whenever morphology or quantitative flags are triggered, the laboratory, before reporting patient results, must validate the results and take the appropriate action in accordance with established standard operating procedures.

Morphology flags appear on the Run Screen and the Review / Edit tab.

The following table identifies the morphology flags and that can be triggered for each test selectivity. The two-letter codes in parentheses appear on the Run Screen.

Flag	Triggering Criteria	CBC	CBC / DIFF	CBC / DIFF / RETIC	CBC / RETIC	RETIC
ANISO	RDW ≥ 16%	✓	✓	✓	✓	
ATYP	%LUC ≥ 4.5 and %LUC ≥ (%BLAST + 1.5)		✓	✓		
BLASTS	1. %BLASTS 1.5% to 5.0% and %LUC ≥ 4.5% or 2. %BLASTS > 5.0% WBCB or 3. %BASO + %BASO Susp + %BASO Sat ≥ 10%		✓	✓		
HCVAR	HDW ≥ 3.4 g/dL	✓	✓	✓	✓	
HYPER	%HYPER ≥ 4%	✓	✓	✓	✓	
HYPO	%HYPO ≥ 4%	✓	✓	✓	✓	
IG	[(%NEUT + %EOS) - %PMN] ≥ 5.0%		✓	✓		

Flag	Triggering Criteria	CBC	CBC / DIFF	CBC / DIFF / RETIC	CBC / RETIC	RETIC
LPLT	%LPLT > 10% PLT	✓	✓	✓	✓	
LS	BASO d/D < 0.15 and %NEUT ≥ 30%		✓	✓		
MACRO	%MACRO ≥ 2.5%	✓	✓	✓	✓	
MICRO	%MICRO ≥ 2.5%	✓	✓	✓	✓	
MPO-D (MO)	[%PMN – (%NEUT + %EOS)] ≥ 25, no NRBC flag and a valid MN-PMN valley (d/D ≥ 0.15)		✓	✓		
NRBC	1. WBCu ≥ to 3000 cells / µL and % nRBC ≥ 2.0% (# nRBC / 100WBC) or 2. # nRBC≥ 200 cells / µL		✓	✓		
PLT-CLM (NW)	Clumps Count > 150		✓	✓		
RBCF	RBCF > 100,000 cells/µL	✓	✓	✓	✓	
RBCG	RBCG > 100,000 cells/µL	✓	✓	✓	✓	

Anisocytosis (ANISO)

Definition

The Anisocytosis flag is triggered if variation in RBC volume (RDW) is equal to or greater than 16%. The Red Cell Distribution Width (RDW) parameter is the coefficient of variation of the cell volume distribution on the RBC volume histogram.

Default trigger values for the three severity levels are:

+ RDW = 16.0% to 17.9%

++ RDW = 18.0% to 22.0%

+++ RDW > 22.0%

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Microcytic anemia
- Macrocytic anemia
- Iron-deficiency anemia response to iron therapy
- Transfusion

System Related

1. Check the RBC reagents.
2. Check the RBC hydraulics.
3. Check the RBC gain
4. Check the laser flowcell alignment

Atypical Lymphocytes (ATYP)

Definition

The presence of atypical lymphocytes is suspected.

An elevated %LUC value on the Perox cytogram may be due to the presence of large atypical lymphocytes, blasts, and/or other large abnormal cells that are peroxidase-negative. Large lymphocytes are defined as those that are larger than the typical lymph population.

Blasts are classified independently on the Baso cytogram. When the %BLASTS is subtracted from the elevated %LUC value, the remaining percentage is due to atypical lymphocytes.

This flag is triggered if %LUC is 4.5 or greater, and the %LUC is greater than the %BLAST by 1.5 or more.

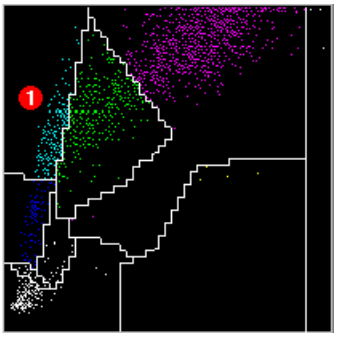
Default trigger values for the three severity levels are:

\+ %LUC = 4.5% to 7.4%

++ %LUC = 7.5% to 10.0%

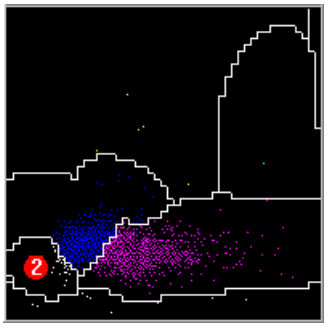
+++ %LUC > 10.0%

Perox Cytogram (ATYP +++)



1 LUC area

Baso Cytogram



2 BLASTS area

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Viral infections
- Lymphoproliferative disorders
- RBC nonlysis

System Related

1. Check the perox reagents.
2. Check the delivery of SHEATH/RINSE.
3. Check the perox hydraulics and sample delivery.
4. Check the perox reaction chamber. temperature
5. Check the perox flowcell alignment.
6. Check the perox gains.

Blasts (BLASTS)

Definition

The presence of blasts is suspected. Blasts are detected in the Blasts area on the Baso cytogram and in the LUC area of the Perox cytogram.

The triggering conditions for this flag are:

- %BLASTS 1.5% to 5.0% and %LUC ≥ 4.5%, or
- %BLASTS > 5.0% of the total WBCB, or
- %BASO + %BASO Susp + %BASO Sat ≥ 10%

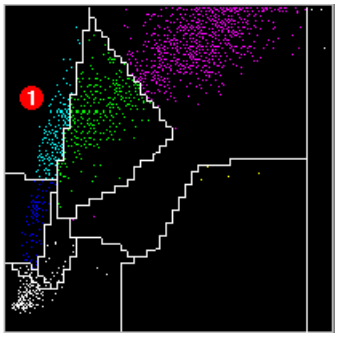
Default trigger values for the three severity levels are:

+ %BLASTS 1.5% to 5.0%

++ %BLASTS > 5.0% to 10.0%

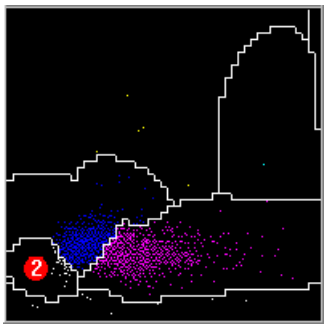
+++ %BLASTS > 10.0%

Perox Cytogram



1 LUC area

Baso Cytogram



2 BLASTS area

The %BLASTS value is intended for flagging and laboratory purposes only. The %BLASTS value is not to be reported as a patient result.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Acute leukemias
- Chronic leukemias
- Lymphomas·
- Myelofibrosis
- Refractory anemia with excess blasts (RAEB)
- Neonatal samples

System Related

1. Check the perox and baso reagents
2. Check the delivery of SHEATH/RINSE.
3. Check the perox hydraulics.
4. Check baso hydraulics.
5. Check the perox flowcell alignment.
6. Check the laser flowcell alignment.
7. Check the pressure and vacuum readings.
8. Check the baso and perox gains.

HGB Concentration Variance (HCVAR)

Definition

The Hgb Concentration Variance flag is triggered if the variation in cell hemoglobin concentration (HDW) is equal to or greater than 3.4 g/dL.

The Hemoglobin Distribution Width (HDW) parameter is the standard deviation of the cellular hemoglobin concentration distribution on the RBC HC histogram.

Default trigger values for the three severity levels are:

+ HDW% = 3.4 g/dL to 3.9 g/dL

++ HDW% = 4.0 g/dL to 4.6 g/dL

+++ HDW% > 4.6 g/dL

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Sickle cell anemia·
- Iron deficiency anemia·
- Hemolytic anemia
- Transfusion

System Related

1. Check RBC reagents.
2. Check RBC hydraulics.
3. Check RBC gains.
4. Check laser flowcell alignment.

Hyperchromia (HYPER)

Definition

The Hyperchromia flag is triggered if the percentage of cells with high (> 41g/dL) cellular hemoglobin concentration (%HYPER) is equal to or greater than 4.0%.

The %HYPER parameter indicates the percent of cells that have a cellular hemoglobin concentration greater than 41 g/dL and is derived from the RBC HC histogram.

Default trigger values for the three severity levels are:

+ %HYPER = 4.0% to 7.9%

++ %HYPER = 8.0% to 12.0%

+++ %HYPER > 12.0%

The %HYPER value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related	System Related
• Hereditary spherocytosis • Sickle cell anemia • Hemolytic uremic syndrome	1. Check RBC reagents. 2. Check the laser sample delivery. 3. Check the RBC gains. 4. Check the laser flowcell alignment

Hypochromia (HYPO)

Definition

The Hypochromia flag is triggered if the percentage of cells with low cellular hemoglobin concentration (%HYPO) is equal to or greater than 4.0%.

The %HYPO parameter indicates the percent of cells that have a cellular hemoglobin concentration less than 28 g/dL and is derived from the RBC HC histogram.

Default trigger values for the three severity levels are:

+ %HYPO = 4.0% to 7.9%

++ %HYPO = 8.0% to 12.0%

+++ %HYPO% > 12.0%

The %HYPO value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Iron deficiency anemia·
- Chronic inflammatory diseases·
- Thalassemia·
- Sideroblastic anemias

System Related

1. Check RBC reagents.
2. Check the laser sample delivery.
3. Check the RBC gains.
4. Check the laser flowcell alignment.

Immature Granulocytes (IG)

Definition

The presence of immature granulocytes is suspected.

The Immature Granulocytes flag is triggered if [(%NEUT + %EOS) - %PMN] ≥ 5.0%.

If present, Immature Granulocytes appear in the neutrophil and eosinophil areas on the Perox cytogram and in the mononuclear (MN) area on the Baso cytogram.

On the BASO cytogram, the eosinophils and neutrophils reside within the Polymorphonuclear (PMN) area. Subtracting the %PMN from the sum of the %NEUT and %EOS provides an estimate of the %Immature Granulocytes.

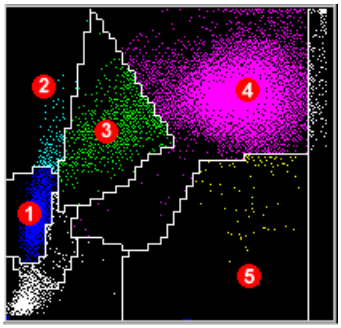
Default trigger values for the three severity levels are:

\+ [(%NEUT + %EOS) - %PMN] = 5.0% to 7.4%

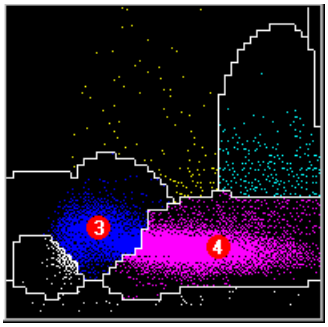
++ [(%NEUT + %EOS) - %PMN] = 7.5% to 10.0%

+++ [(%NEUT + %EOS) - %PMN] > 10.0%

Perox Cytogram



Baso Cytogram



1 Lymph **2** LUC **3** Mono **4** Neut **5** Eos **6** MN **7** PMN

MN (6) = Lymphs (1) + LUCs (2) + Monos (3)
PMN (7) = Neut (4) +Eos (5)

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related	System Related
• Myelocytic leukemia	1. Troubleshoot the baso channel.
• Chronic infections·	2. Troubleshoot the perox channel.
• Neonatal samples	3. Check the baso and perox gains.

Large Platelets (LPLT)

Definition

The Large Platelets flag is triggered if the percentage of large platelets (%LPLT) is greater than 10% of the platelet count.

The %LPLT parameter indicates the percent of platelets with volumes greater than 20 fL. This parameter is derived from the Platelet Volume histogram based on Integrated Analysis.

Default trigger values for the three severity levels are:

+ %LPLT = 10.0% to 11.9%

++ %LPLT = 12.0% to 14.0%

+++ %LPLT > 14.0%

The %LPLT value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related	System Related
• CML	1. Check the RBC reagents.
• Bone marrow transplant	2. Check the RBC hydraulics.
• Chemotherapy	3. Check the RBC and PLT gains.
	4. Check the laser flowcell alignment

Left Shift (LS)

Definition

The presence of nonsegmented neutrophils (bands) is suspected.

The Left Shift flag is triggered if bands obstruct the MN/PMN valley. The flag is not triggered if %NEUT is less than 30%

For normal samples, the valley separating the MN and PMN populations is well defined, as determined by its relative depth (d/D). If this valley becomes too shallow (d/D < 0.15), the MN and PMN populations cannot be separated.

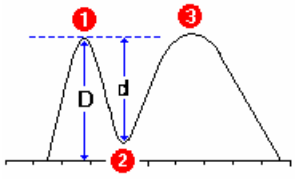
The + LS flag is triggered if BASO d/D is less than 0.15.

The Lobularity Index (LI) is used to set the severity levels for this flag.

The LI is the PMN peak channel number on the Baso X histogram divided by 14, and it is greater than 1.9 for normal samples. Values lower than 1.9 are usually indicative of sample abnormality.

In samples where a bimodal distribution is not present, only PMN populations with PMN peaks greater than channel 20 will be considered as valid PMN populations. Below channel 20 the software will interpret the peak as a MN population and the LI value will be blanked. Whenever a PMN peak is identified, the LI result will be reported.

NOTE
If there is no value for MNx, there is also no value for the Lobularity Index (LI).



1 MN peak channel

2 MN/PMN valley channel

3 PMN peak channel

Default trigger values for the three Left Shift severity levels are:

+ LI > 1.9

++ LI = 1.7 to 1.9

+++ LI < 1.7

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Aged samples
- Chronic infections
- Myeloproliferative disorders·
- Neonatal samples

System Related

1. Troubleshoot the baso channel.
2. Troubleshoot the perox channel.

Macrocytosis (MACRO)

Definition

The Macrocytosis flag is triggered if the percentage of red blood cells with higher than normal cell volumes (%MACRO) is equal to or greater than 2.5%

The %MACRO parameter indicates the percent of red blood cells that have a volume equal to or greater than 120 fL and is derived from the RBC volume histogram.

Default trigger values for the three severity levels are:

\+ %MACRO = 2.5% to 6.4%

++ %MACRO = 6.5% to 10.5%

+++ %MACRO > 10.5%

The %MACRO value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Macrocytic anemia
- Alcoholism
- Hemolytic anemia
- Myelodysplastic anemia
- Neonatal samples

System Related

1. Check the RBC reagents.
2. Check the RBC hydraulics.
3. Check the RBC gains.
4. Check the laser flowcell alignment.

Microcytosis (MICRO)

Definition

The Microcytosis flag is triggered if the percentage of red blood cells with lower than normal cell volumes (%MICRO) is equal to or greater than 2.5%.

The %MICRO parameter indicates the percent of red blood cells that have a volume equal to or lower than 60 fL and is derived from the RBC volume histogram.

Default trigger values for the three severity levels are:

+ %MICRO = 2.5% to 6.4%

++ %MICRO = 6.5% to 10.5%

+++ %MICRO > 10.5%

The %MICRO value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Iron deficiency anemia·
- Hemoglobinopathies·
- Hemolytic anemias

System Related

1. Check the RBC reagents.
2. Check the RBC hydraulics.
3. Check the RBC gains.
4. Check the laser flowcell alignment.

Myeloperoxidase Deficiency (MPO-D, MO)

Definition

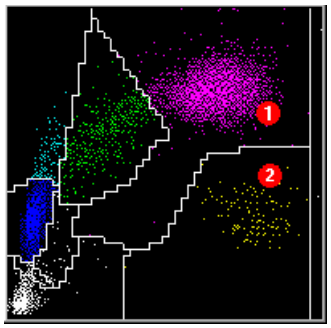
Sample is a weak peroxidase stainer.

This flag is triggered if [%PMN - (%NEUT + %EOS)] ≥ 25, the NRBC flag was not triggered, and there is a valid MN-PMN valley (d/D ≥ 0.15).

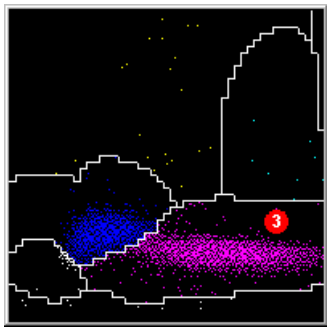
You must perform a manual differential on samples that trigger the Myeloperoxidase Deficiency flag.

Normal Peroxidase Staining

Perox Cytogram



Baso Cytogram

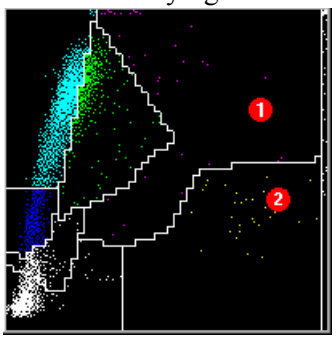


Because %PMN - (%NEUT +%EOS) is close to 0, there is no flag.

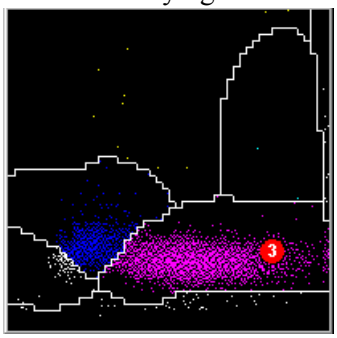
By inspection, the sum of the events in the NEUT (**1**) and EOS (**2**) areas appears approximately equal to the count in the PMN area (**3**).

Weak Peroxidase Staining (MPO flag)

Perox Cytogram



Baso Cytogram



Because %PMN – (%NEUT + %EOS) is greater than 25, the flag is triggered.

By inspection, the sum of the events in the NEUT (**1**) and EOS (**2**) areas is much less than the count in the PMN area (**3**).

Results Flagged

%NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %BASO, #BASO, %LUC, and #LUC

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related	System Related
• Myeloperoxidase deficiency	1. Troubleshoot the perox channel. 2. Check the perox reagents. 3. Check peroxidase hydraulics. 4. Check the perox reaction chamber temperature.

Nucleated Red Blood Cells (NRBC)

Definition

The detection of nucleated red blood cells, or the occurrence of either the Suspect Cellular Interference (NRCELL) flag or the Suspect Large Platelets (NRLPLT) flag will trigger the NRBC Morphology flag.

There is no severity level associated with this flag.

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related	System Related
• Neonatal samples· • Hemoglobinopathies· • Hemolytic anemia· • Myelodysplastic syndromes	1. Check perox reagents. 2. Check the perox reaction chamber temperature. 3. Check peroxidase hydraulics and sample delivery. 4. Check perox gains.

Platelet Clumps (PLT-CLM, NW)

Definition

Presence of clumped platelets is suspected.

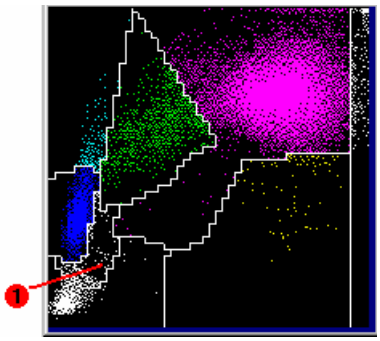
The Platelet Clumps flag is triggered if the Clumps Count in the PLT Clumps region of the Perox cytogram is greater than 150. The PLT count is flagged to alert the user that the platelet count may not be accurate due to the presence of platelet clumps.

The PLT Clump area of the Perox cytogram originates in the Noise area and extends upward to the right of the lymphocyte population. The number of events obtained from this area is called the Clumps Count.

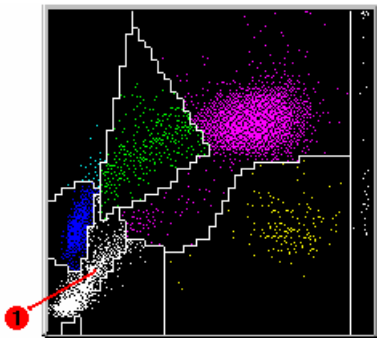
The Clumps Count is excluded from the WBCP and differential results.

There is no severity level associated with this flag.

Perox Cytogram
Normal Sample



Perox Cytogram
PLT-CLM flag



1 = PLT Clumps area

Results Flagged

WBCP, PLT, PCT, MPV, and PDW

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Traumatic venipuncture·
- Anticoagulants·
- Autoimmune platelet disorders
- Lipemia

RBC Fragments (RBCF)

Definition

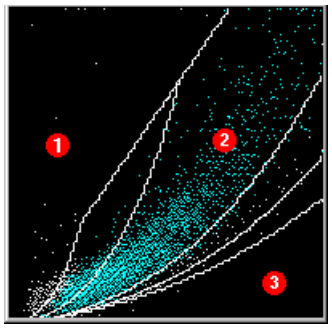
The presence of RBC fragments is suspected.

This flag is triggered if the number of events in the RBC Fragment area of the PLT Scatter cytogram is greater than 100,000 cells/µL. The event count in this area includes red blood cell fragments with volumes less than 30fL and refractive indexes greater than 1.400.

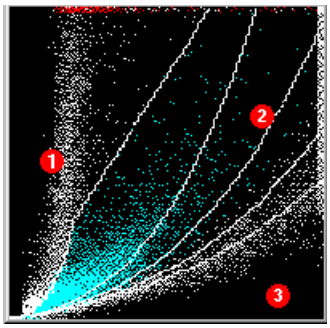
RBC fragments are excluded from the PLT count and the RBC count.

There are no severity levels associated with this flag.

Normal
PLT Scatter Cytogram



Abnormal
PLT Scatter Cytogram



1 RBC Ghost area
2 Platelet area
3 RBC Fragment area

NOTE
Whenever the ratio of RBC fragments to platelets exceeds 0.25, the system uses the log normal fit calculation to determine the platelet count, and the log normal fit curve appears on the Platelet Volume histogram.

The RBC Fragment value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Hemolytic anemia·
- Prosthetic heart valves·
- Severe burns·
- Sickle Cell Anemia

RBC Ghosts (RBCG)

Definition

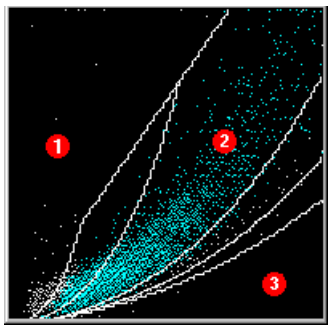
The presence of RBC ghosts is suspected.

This flag occurs if the number of events in the RBC Ghost area of the PLT Scatter cytogram is greater than 100,000 cells/µL. The events counted in this area have refractive indexes lower than 1.350.

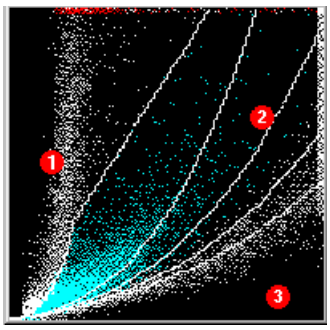
RBC ghosts are excluded from the PLT count and the RBC count.

There are no severity levels associated with this flag.

Normal
PLT Scatter Cytogram



Abnormal
PLT Scatter Cytogram



1 RBC Ghost area
2 Platelet area
3 RBC Fragment area

The RBC Ghost value is intended for flagging and laboratory purposes only.

Results Flagged

none

Possible Causes

The following list of sample-related causes may not contain all conditions that could cause this flag.

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

Sample Related

- Hemolysis·
- Cryoglobulins·
- Chylomicrons·
- Pyropoikilocytosis·
- Lipemia

Sample/System Flags

Summary

Through the use of complex flagging algorithms, laboratory personnel are alerted to suspected abnormal sample and/or system conditions.

Sample/system flags appear on the Run Screen and the Review / Edit tab.

Whenever such flags are triggered, the user should review the results and take the action recommended. The following table identifies the sample/system flags that could be triggered for each test selectivity. The two-letter codes in parentheses appear on the Sample/System Flag Analysis panel of the Run Screen.

Flag	Triggering Criteria	CBC	CBC / DIFF	CBC / DIFF / RETIC	CBC / RETIC	RETIC
B-SUSP (BC)	Events above the upper MN/PMN threshold on y axis and in channels 0 to 49 on x axis ≥ 5%		✓	✓		
BIFR (BR)	Baso Flatness > 2.5	✓	✓	✓	✓	
B-NO (NB)	Baso % Noise > 10	✓	✓	✓	✓	
B-NV (VB)	1. (BASO d/D) < 0.15	✓	✓	✓	✓	
	2. Flag is not set if there is WBC agreement (no WBC-CE flag) and [(%NEUT + %EOS) - %PMN] is between 0 and 7.5.					
B-SAT (BS)	1. Baso % Saturation > 2.5	✓	✓	✓	✓	
	2. Flag is not set if there is WBC agreement (no WBC-CE flag).					
BTO (TB)	1. Baso chamber temperature is not between 31.9°C and 34.1°C.	✓	✓	✓	✓	
	2. Flag is not set if there is WBC agreement (no WBC-CE flag) and [(%NEUT + %EOS) - %PMN] is between 0 and 7.5.					
CHCMCE (CC)	(MCHC - CHCM) > 1.9	✓	✓	✓	✓	

Flag	Triggering Criteria	CBC	CBC / DIFF	CBC / DIFF / RETIC	CBC / RETIC	RETIC
HGBIFR (HR)	HGB Sample Flatness > 1000	✓	✓	✓	✓	
HGB-PL (PH)	HGB baseline is not between 2.5 and 4.1	✓	✓	✓	✓	
LAS-PL(PL)	Laser light intensity < 150	✓	✓	✓	✓	✓
NRCELL (NC)	WBCP / WBCB > 1.1			✓	✓	
NR-LPD (NL)	1. BASO % Noise > 2 2. BASO % Noise x WBCB > 10			✓	✓	
NRLPLT (NP)	LPLT > 40 x $10^3/\mu L$			✓	✓	
NRPXNV	No valley between the NRBC and lymphocyte populations and a reportable NRBC count.			✓	✓	
PLT-NO (NT)	1. LPLT and ANISO flags are triggered (any severity level 2. LPLT and MICRO flags are triggered (any severity level).	✓	✓	✓	✓	
PLTORN (OT)	Events in the Platelet Origin Noise area are > 2% of the total events the PLT cytogram	✓	✓	✓	✓	
PX-NV (VX)	1. (PEROX d/D) < 0.15 2. Flag is not set if there is WBC agreement (no WBC-CE flag) and [(%NEUT + %EOS) - %PMN] is between 0 and 7.5.		✓	✓		
PXIFR (XR)	Perox Flatness > 3.2		✓	✓		

Flag	Triggering Criteria	CBC	CBC / DIFF	CBC / DIFF / RETIC	CBC / RETIC	RETIC
PX-NO (NX)	1. Perox % Noise > 60% 2. Flag is not set if there is WBC agreement (no WBC-CE flag) and [(%NEUT + %EOS) - %PMN] is between 0 and 7.5.		✓	✓		
PX-PL (PX)	Perox light intensity < 90		✓	✓		
PX-SAT (XS)	1. Perox % Saturation > 10 2. Flag is not set if there is WBC agreement (no WBC-CE flag).		✓	✓		
PXTO (TX)	1. Perox chamber temperature is not between 58°C and 72.1°C 2. Flag is not set if there is WBC agreement (no WBC-CE flag) and [(%NEUT + %EOS) - %PMN] is between 0 and 7.5.		✓	✓		
RBCIFR (RR)	RBC Flatness > 3.2	✓	✓	✓	✓	
RTCint (CT)	Platelet threshold below channel 5			✓	✓	✓
RTCADA (CA)	1. Absorption mode for Gaussian fit is not between channels 6 and 30 2. SD of RETIC Abs histogram over 80% of height > 1.4 3. Measured mean absorption minus the theoretical absorption > 30%			✓	✓	✓
RTCIFR (CR)	Retic Flatness > 3.2			✓	✓	✓

Flag	Triggering Criteria	CBC	CBC / DIFF	CBC / DIFF / RETIC	CBC / RETIC	RETIC
RTC-FS (FC)	1. Difference between mean and mode RETIC Abs Histogram > 15% 2. Chi-square error for the Gaussian fit > 80,000			✓	✓	✓
RTC-NO (NO)	Noise Origin > 10% of gated cells			✓	✓	✓
RTC-L (CL)	Cells analyzed < 10,000			✓	✓	✓
RTC-FL (RF)	CV for RETIC Abs Flatness histogram > 3.6			✓	✓	✓
RTCSAT (CS)	Saturation cells > 10% of gated cells			✓	✓	✓
RTC-SE (SE)	Slope of negative cell population on absorption axis > 0.2			✓	✓	✓
WBC-CE (WC)	1. (WBCB - WBCP) ≥ 1.0 x 10^3 / µL when WBCB ≥ 2.0 x 10^3 / µL and ≤ 10.0 x 10^3 / µL 2. (WBCB - WBCP) ≥ 10% of WBCB when WBCB ≥10.0 x 10^3 / µL 3. (WBCB-WBCP) > 20% WBCB when WBCB ≤ 2.0 x 10^3 / µL 4. WBCB count is not flagged if the PX-NV or PX-NO flags are set.		✓	✓		
WBCSUB (WS)	If WBCB is flagged but WBCP is not, the WBCP value is reported. If both WBCB and WBCP are flagged, WBCB is reported. If WBCB < 1000 cells/µL, WBCB is reported with an asterisk.		✓	✓		

Baso Count Suspect (B-SUSP, BC)

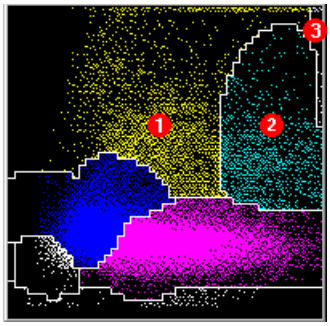
Definition

The Baso Count Suspect flag is triggered if the percentage of events acquired in the region of the Baso cytogram located above the upper MN/PMN threshold and between channels 0 and 49 on the x axis exceeds 5.0%.

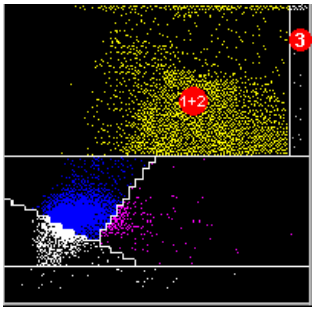
When cluster analysis is applied, the Baso Count Suspect region of the Baso cytogram is located above the upper MN/PMN threshold. Events in this region are not classified as basophils and are excluded from the basophil count. The %BASO Suspect parameter is calculated from the Baso Count Suspect region and is available in the Baso Parameter group on the Run Screen.

When histogram analysis is applied, the Baso Count Suspect region is located above channel 21 on the y axis and in channels 0 and 49 on the x axis.

Baso Cytogram
(cluster analysis)



Baso Cytogram
(histogram analysis)



1 Basophils

2 BASO Suspect

3 Baso Saturation

Results Flagged

%BASO, #BASO, %LYMPH, #LYMPH, %LUC, #LUC
A four-part WBC differential (basophils excluded) is reported with the measured BASO values displayed and flagged, and with the LYMPH and LUC values also flagged.

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check baso reagents.
2. Check the baso reaction chamber temperature.
3. Check baso hydraulics.
4. Check baso gains
5. Check the RBC/Baso/Retic flowcell alignment.

Sample Related

- High WBC Count
- Leukemia
- High Baso count
- Aged Blood
- Treated CLL

Baso Irregular Flow Rate (BIFR, BR)

Definition

The Baso Irregular Flow Rate flag is triggered when the cell counting rate is erratic because of a hydraulic disturbance in the baso channel.

Baso flow rate is evaluated in terms of the cell counting rate:

$$\text{Flow Uniformity} = \sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$$

The flag is triggered if this value is greater than 2.5.

The BASO Rate Histogram displays the arrival rate of cells in the baso channel.

Normal BASO Rate Histogram



BIFR BASO Rate Histogram



Results Flagged

WBC, WBCB, %BASO, #BASO

Corrective Action

1. Check baso reagents.
2. Check baso hydraulics.
3. Check sheath delivery.

A partially clogged RBC/baso/retic sheath filter can produce a distinctive “ski slope” effect on the RBC, Baso, and Retic flow rate histograms. Replace the sheath filter.

RBC Rate



Baso Rate



Retic Rate



Baso Noise (B-NO, NB)

Definition

The Baso Noise flag is triggered if the events counted in the Noise area of the Baso cytogram are more than 10% of the baso signals.

The B-NO (NB) flag may cause a substitution of the WBC count.

The following rules determine if the WBCB or WBCP count is reported for a CBC/Diff sample:

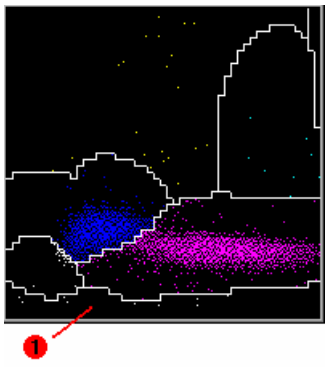
- WBCB is the primary WBC count.
- If B-NO or B-SAT flags are triggered, the WBCP count is reported if valid.
- If a B-NO flag and a PX-NO or PX-SAT flag are triggered, the WBCB count is reported with a sample/system flag.
- WBCB is reported as the WBC count for samples with a WBC lower than 1.0 x 10^3 / µL.

The Noise area (1) of the Baso cytogram is determined by cluster analysis.

If histogram analysis is applied, the Noise area (2) is located between channels 0 and 8 on the y axis.

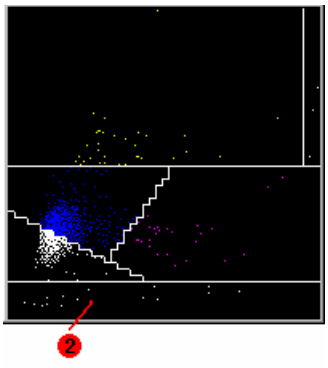
Cluster Analysis

1 noise cluster



Histogram Analysis

2 noise area



Results Flagged

WBC, WBCB, %BASO, #BASO

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check baso reagents.
2. Check baso hydraulics.
3. Check the pressure and vacuum readings.
4. Check sheath delivery.
5. Check the baso reaction chamber temperature.
6. Check RBC/Baso/Retic flowcell alignment.

Sample Related

- Lipemia
- High WBC count
- Extreme eosinophilia
- Malaria parasites
- Aged Blood

Baso No Valley (B-NV, VB)

Definition

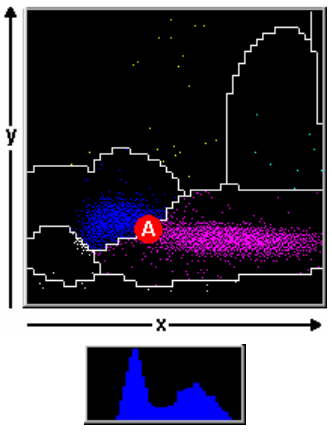
The Baso No Valley flag is triggered if there is no valid separation between the mononuclear (MN) and polymorphonuclear (PMN) populations in the Baso cytogram. The B-NV (VB) flag is not triggered if agreement between the baso and perox results is indicated by both the following conditions:

- WBCB and WBCP agree within specified limits (No WBC-CE flag)
- [(%NEUT + %EOS) - %PMN] is between 0 and 7.5

Separation of the MN and PMN populations along the x axis of the Baso cytogram is evaluated by the relative depth of the valley between the two populations.

In normal samples, the relative Baso d/D is greater than 0.15. The B-NV flag is triggered if the relative depth is less than 0.15 and there is no agreement between perox and baso results.

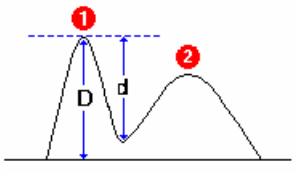
Normal



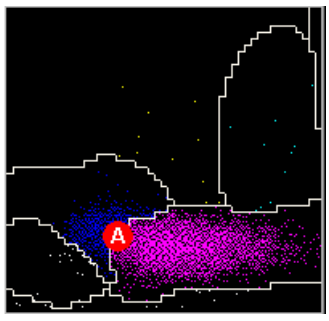
1 MN peak

2 PMN peak

A MN/PMN Valley



B-NV (VB) Flag



Results Flagged

LI

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check baso reagents.
2. Check baso hydraulics.
3. Check the baso reaction chamber temperature.
4. Check sheath delivery.
5. Check RBC/Baso/Retic flowcell alignment.

Sample Related

- Aged blood
- Absolute lymphocytosis
- Immature granulocytes
- Unsegmented neutrophils (bands)

Baso Saturation (B-SAT, BS)

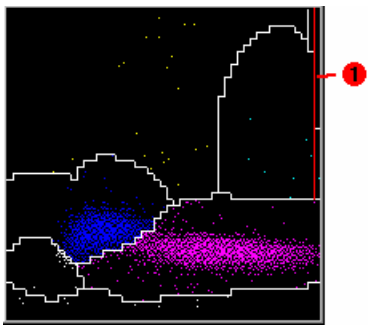
Definition

The Baso Saturation flag is triggered if the number of events in the Saturation area of the Baso cytogram is greater than 2.5% of the baso signals.

This flag is not triggered if WBCB and WBCP agree within specified limits (no WBC-CE flag).

The Saturation area of the Baso cytogram is located to the right of the fixed threshold at channel 46 above the upper MN/PMN threshold (1). This area can contain air bubbles, unlysed cells, and cell clumps.

Baso Cytogram



1 Baso Saturation area

The B-SAT (BS) flag may cause a substitution of the WBC count.

The following rules determine if the WBCB or WBCP count is reported for a CBC/Diff sample:

- WBCB is the primary WBC count.
- If B-NO or B-SAT flags are triggered, the WBCP count is reported if valid.
- If a B-NO flag and a PX-NO or PX-SAT flag are triggered, the WBCB count is reported with a sample/system flag.
- WBCB is reported as the WBC count for samples with a WBC lower than 1.0 x 10^3 / μL.

Results Flagged

WBCB

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check baso reagents.
2. Check the pressure and vacuum readings.
3. Check sheath delivery.
4. Check baso hydraulics.
5. Check RBC/Baso/Retic flowcell alignment.

Sample Related

- Leukemia (high WBC)
- Fungal infections
- Cell clumps

Baso Temperature out of Range (BTO, TB)

Definition

The Baso Temperature Out of Range flag is triggered if the baso reaction chamber temperature is not between 31.9°C and 34.1°C.

The BTO (TB) flag is not triggered if agreement between the baso and perox results is indicated by both the following conditions:

- WBCB and WBCP agree within specified limits (No WBC-CE flag)
- [(%NEUT + %EOS) - %PMN] is between 0 and 7.5

Results Flagged

WBC, WBCB, %BASO, #BASO, %LYMPH, #LYMPH
A four-part WBC differential (basophils excluded) is reported with the measured BASO values displayed and flagged, and with the LYMPH and LUC values also flagged.

Corrective Action

1. Check the baso reaction chamber temperature.
2. Check the reaction chamber temperature controller, including the electrical connection.

Comparison Error MCHC / CHCM (CHCMCE, CC)

Definition

The Comparison Error MCHC/CHCM flag is triggered if the difference between the MCHC and CHCM values is greater than 1.9.

Results Flagged

MCHC, CHCM, RBC, MCV, HGB, HCT, MCH, RDW, HDW, CH, CHDW

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. If another flag appears along with the comparison error, troubleshoot that error first.
2. To determine the faulty channel, run the same normal whole blood sample five times to check precision of the RBC, MCV, and HGB values. Then, run a normal-level control to check accuracy.
 a. If all results are acceptable, calibrate RBC, MCV, CHCM, and HGB parameters.
 b. If the HGB results are faulty, troubleshoot the hemoglobin channel.
 c. If RBC or MCV results are faulty, troubleshoot the RBC channel.

Sample Related

- Lipemia
- Leukemia (high WBC)
- Neonatal (NRBCs)
- Hemolytic anemias
- Cold agglutinins

Comparison Error WBCB/WBCP (WBC-CE, WC)

Definition

The Comparison Error WBCB/WBCP flag is triggered if the difference in the WBC counts obtained from the baso and perox channels exceeds a preset limit.

The WBC count for each sample is independently determined in the baso channel (WBCB) and the perox channel (WBCP).

The flag is triggered if:

- (WBCB - WBCP) ≥ 1.0 x 10^3 / µL when WBCB ≥ 2.0 x 10^3 / µL and ≥ 10.0 x 10^3 / µL
- (WBCB - WBCP) ≥ 10% of WBCB when WBCB ≥ 10.0 x 10^3 / µL
- (WBCB - WBCP) ≥ 20% of WBCB when WBCB ≥ 2.0 x 10^3 / µL

Results Flagged

WBC, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %BASO, #BASO, %LUC, #LUC

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. If the Perox Noise (PX-NO) and/or No Valley Perox (PX-NV) sample/system flags are triggered, troubleshoot the perox channel.
2. If there are no perox flags, troubleshoot the baso channel.

Sample Related

- Incomplete red cell lysis
- Nucleated red blood cells
- Malaria parasites

Hgb Irregular Flow Rate (HGBIFR, HR)

Definition

The HGB Irregular Flow Rate flag is triggered if HGB baseline or sample transmission is erratic.

For each sample, the difference between the maximum and minimum transmittance is obtained for the baseline and sample transmittance.

The flag is triggered if the baseline or sample value is greater than 1000.

HGB Trans Histogram



1 Sample transmittance

2 Baseline transmittance

Results Flagged

HGB, MCH and MCHC

Corrective Action

1. Check HGB reagents.
2. Check Hgb hydraulics and sample delivery.
3. Check delivery of SHEATH/RINSE.
4. Check the pressure and vacuum readings.

Hgb Power Low (HGB-PL, PH)

Definition

The Hgb Power Low flag is triggered if the HGB baseline transmission is less than 2.5 or greater than 4.1.

Results Flagged

HGB, MCH, and MCHC

Corrective Action

1. Adjust the Hgb baseline.
2. Perform the rinse reagent check.
3. Replace the Hgb lamp.

Laser Power Low (LAS-PL, PL)

Definition

The Laser Power Low flag is triggered if the laser light intensity in the RBC/Baso/Retic channel is less than 150.

Results Flagged

RBC, HCT, MCV, MCH, MCHC, CH, CHDW, CHCM, RDW, HDW, PLT, MPV, PDW, WBCB, WBC, %BASO, #BASO, #RETIC, %RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

Corrective Action

1. Flush the RBC/Baso/Retic flowcell
2. Perform the sheath reagent check.
3. Remove and clean the RBC/Baso/Retic flowcell.
4. Replace the laser diode.

No Perox NRBC / Lymph Valley (NRPXNV, NV)

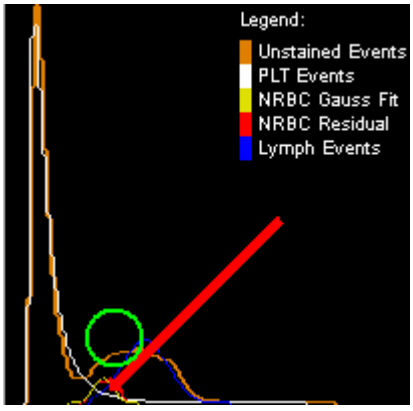
The No Perox NRBC / Lymph Valley flag is triggered if there is no valley between the nRBC and lymphocyte populations when the system reports an NRBC count.

Results Flagged

#NRBC, %NRBC, WBC, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %BASO, #BASO, %LUC, #LUC

The green circles in both the NRBC Enumeration histogram and Noise-lymph histogram below show no valley separating lymphocyte events from the nRBC population. The red arrow identifies the nRBC events.

NRBC Enumeration Histogram



Noise-Lymph Histogram



Perox Irregular Flow Rate (PXIFR, XR)

Definition

The Perox Irregular Flow rate flag is triggered if the cell counting rate is erratic because of a hydraulic disturbance in the perox channel.

Perox flow rate is evaluated in terms of the cell counting rate:

$$\text{Flow Uniformity} = \sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$$

The flag is triggered if this value is greater than 3.2.

The Perox Rate Histogram displays the arrival rate of the cells in the perox channel.

Normal Perox Rate Histogram



PXIFR Perox Rate Histogram



Results Flagged

WBCP, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %LUC, and #LUC

Corrective Action

1. Check perox reagents.
2. Check perox hydraulics and sample delivery.
3. Check sheath delivery.
4. Check the pressure and vacuum readings.

Perox No Valley (PX-NV, VX)

Definition

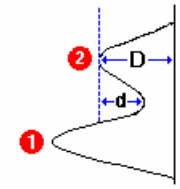
The Perox No Valley flag is triggered if there is no valid separation between the noise and lymphocyte populations in the Perox cytogram.

The separation of the noise and lymphocyte populations along the y axis of the Perox cytogram is evaluated by the relative depth of the valley (PEROX d/D) between the two populations.

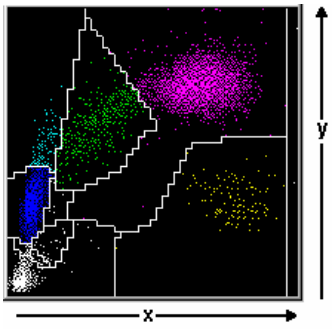
In normal samples, PEROX d/D is greater than 0.15. This flag is triggered if PEROX d/D is less than 0.15.

1 Noise peak

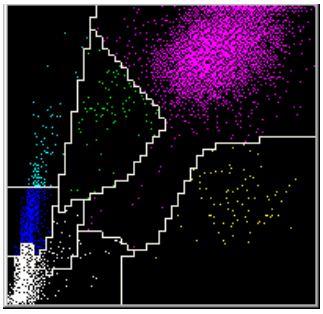
2 Lymph peak



Normal



PX-NV (VX) Flag



Noise-Lymph



Noise-Lymph



The PX-NV (VX) flag is not triggered if agreement between the baso and perox results is indicated by both the following conditions:

- WBCB and WBCP agree within specified limits (No WBC-CE flag)
- [(%NEUT + %EOS) - %PMN] is between 0 and 7.5

Results Flagged

WBCP, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %LUC, and #LUC

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check perox reagents.
2. Check peroxidase hydraulics and sample delivery.
3. Check delivery of SHEATH/RINSE.
4. Check PEROX SHEATH delivery.
5. Check the pressure and vacuum readings.
6. Check the perox reaction chamber temperature.
7. Check perox flowcell alignment.
8. Check perox gains.

Sample Related

- Neonatal samples
- Aged blood sample
- Malaria parasites

Perox Noise (PX-NO, NX)

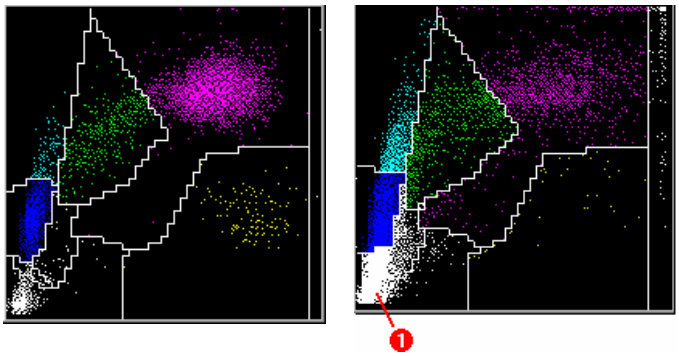
Definition

The Perox Noise flag is triggered if 60% or more of the perox signals come from the Noise area of the Perox cytogram.

This flag is triggered if 60% or more of the PEROX events are counted in the Noise area.

Normal
Perox Cytogram

PX-NO
Perox Cytogram



1 Noise area

The PX-NO (NX) flag is not triggered if agreement between the baso and perox results is indicated by both the following conditions:

- WBCB and WBCP agree within specified limits (No WBC-CE flag)
- [(%NEUT + %EOS) - %PMN] is between 0 and 7.5The Noise area is located in the lower left corner of the Perox cytogram (**1**).

Results Flagged

WBCP, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %LUC, and #LUC

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check perox reagents.
2. Check peroxidase hydraulics and sample delivery.
3. Check delivery of SHEATH/RINSE.
4. Check PEROX SHEATH delivery.
5. Check the pressure and vacuum readings.
6. Check the perox reaction chamber temperature.
7. Check perox flowcell alignment.
8. Check perox gains.

Sample Related

- Neonatal samples
- Aged blood sample
- Malaria parasites
- Lyse-resistant RBCs

Perox Power Low (PX-PL, PX)

Definition

The Perox Power Low flag is triggered if the tungsten-halogen light intensity in the Perox channel is less than 90.

Results Flagged

WBCP, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %LUC, and #LUC

Corrective Action

1. Perform the sheath reagent check.
2. Check perox lamp alignment.
3. Replace the tungsten-halogen lamp.

Perox Saturation (PX-SAT, XS)

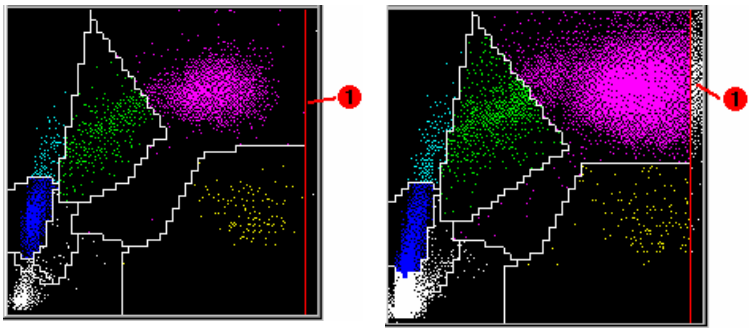
Definition

The Perox Saturation flag is triggered if the events counted in the Saturation area are more than 10% of Perox signals

The Saturation area of the Perox cytogram is located in channels 97 through 99 on the x axis.

Normal
Perox Cytogram

PX-SAT
Perox Cytogram



1 Saturation area

The PX-SAT (XS) flag is not triggered if WBCB and WBCP agree within specified limits (no WBC-CE flag).

The WBCP count does not include events from the Saturation area.

Results Flagged

WBCP, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %LUC, and #LUC

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check perox reagents.
2. Check peroxidase hydraulics and sample delivery.
3. Check delivery of SHEATH/RINSE.
4. Check PEROX SHEATH delivery.
5. Check the pressure and vacuum readings.
6. Check the perox reaction chamber temperature.
7. Check perox flowcell alignment.
8. Check perox gains.

Sample Related

- Immature granulocytes
- Severe toxic granulation
- Promyelocytic leukemia

Perox Temperature out of Range (PXTO, TX)

Definition

The Perox Temperature Out of range flag is triggered if the Peroxidase reaction chamber temperature is not between 58°C and 72.1°C.

The PXTO (TX) flag is not triggered if agreement between the baso and perox results is indicated by both the following conditions:

- WBCB and WBCP agree within specified limits (No WBC-CE flag)
- [(%NEUT + %EOS) - %PMN] is between 0 and 7.5

Results Flagged

WBCP, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %LUC, and #LUC

Corrective Action

1. Check the perox reaction chamber temperature.
2. Check the reaction chamber temperature controller, including the electrical connection.

Platelet Noise (PLT-NO, NT)

Definition

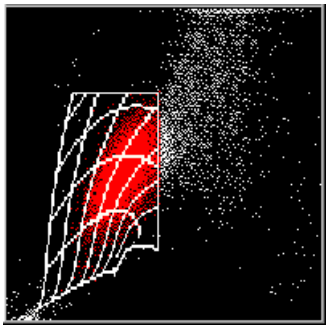
The PLT-NO flag indicates the presence of sample interferences such as microcytes or RBC fragments that could be counted as large platelets

The PLT-NO flag is triggered under either of the following conditions:

- LPLT and ANISO flags are triggered (any severity level).
- LPLT and MICRO flags are triggered (any severity level).

Normal Sample

RBC Scatter

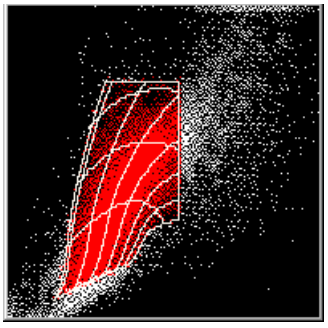


Platelet Vol

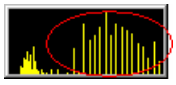


PLT-NO Flag

RBC Scatter



Platelet Vol



Results Flagged

PLT, PCT, MPV, and PDW

Corrective Action

The following conditions may not be the only ones that could cause this flag.

- Pronounced microcytosis
- Increased RBC fragments (RBCF)

Platelet Origin Noise (PLTORN, OT)

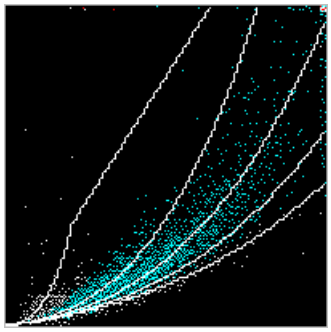
Definition

The Platelet Origin Noise flag indicates the occurrence of system induced noise that might affect RBC and PLT results.

The PLTORN flag is triggered when the number of events in the Platelet Origin Noise area of the PLT cytogram exceeds 2% of the total number of events.

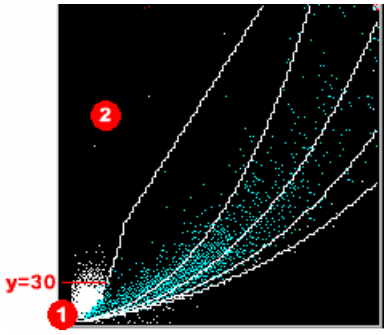
Normal Sample

PLT Cytogram



PLTORN Flag

PLT Cytogram



1 Platelet Origin Noise area
2 RBC Ghosts area

Results Flagged

RBC, MCV, HCT, MCH, MCHC, CH, CHCM, CHDW, RDW, HDW, PLT, PCT, MPV, and PDW

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem.

- Check RBC/PLT reagents
- Contact your Siemens Field Service Representative.

RBC Irregular Flow Rate (RBCIFR, RR)

Definition

The RBC Irregular Flow Rate flag is triggered if the cell counting rate is erratic because of a hydraulic disturbance in the RBC/PLT channel.

RBC flow rate is evaluated in terms of the cell counting rate:

$$\text{Flow Uniformity} = \sqrt{\frac{\text{Sum of the Squared Differences}}{\text{9 x Mean Cell Counting Rate}}}$$

The flag is triggered if this value is greater than 3.2.The RBC Rate Histogram displays the arrival rate of cells in the RBC channel.

Normal RBC Rate Histogram



RBCIFR RBC Rate Histogram



Results Flagged

RBC, HCT, MCV, MCH, MCHC, CHCM, CH, CHDW, RDW, HDW, PLT, MPV, PDW

Corrective Action

1. Check RBC reagents.
2. Check RBC hydraulics.
3. Check sheath delivery.
4. Check the pressure and vacuum readings.

A partially clogged RBC/baso/retic sheath filter can produce a distinctive “ski slope” effect on the RBC, Baso, and Retic flow rate histograms. Replace the sheath filter.

RBC Rate



Baso Rate



Retic Rate



Retic – Plt Interference Error (RTCint, CT)

Definition

The RTCint flag is triggered if the platelet threshold is set below scatter channel 5. If the flag is triggered, platelets may be counted in the gated mature RBC population.

Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWg, CHDWr, MCVg, MCVr, RDWg, RDWr

Corrective Action

1. Check retic reagents.

2. Flush the flowcell.

Retic Absorption Distribution Abnormal (RTCADA, CA)

Definition

The RTCADA flag is triggered if the absorption distribution for the gated cell population is abnormal.

The absorption distribution of the histogram is sufficiently abnormal that the reticulocyte population may not be gated correctly.

The flag is triggered if:

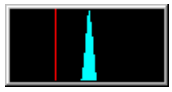
The mode of the calculated Gaussian fit for the absorption histogram is below channel 6.

Retic Abs



The mode of the calculated Gaussian fit for the absorption histogram is above channel 30.

Retic Abs



The SD of the absorption histogram above 80% of the original histogram height is greater than 1.4.

Retic Abs



The measured mean absorption minus the theoretical absorption is greater than 30%.

Retic Abs F



Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related	Sample Related

1. Check retic reagents.
2. Check RBC/Baso/Retic hydraulics.
3. Check retic hydraulics.
4. Check sheath delivery.
5. Check the pressure and vacuum readings.

- Aged blood
- Transfusion
- Sickle cell anemia
- High numbers of NRBCs

Retic Absorption Flatness (RTC-FL, RF)

Definition

The Retic Absorption Flatness flag is triggered when the CV (coefficient of variation) for the RETIC ABS Flatness histogram is greater than 3.6.

Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

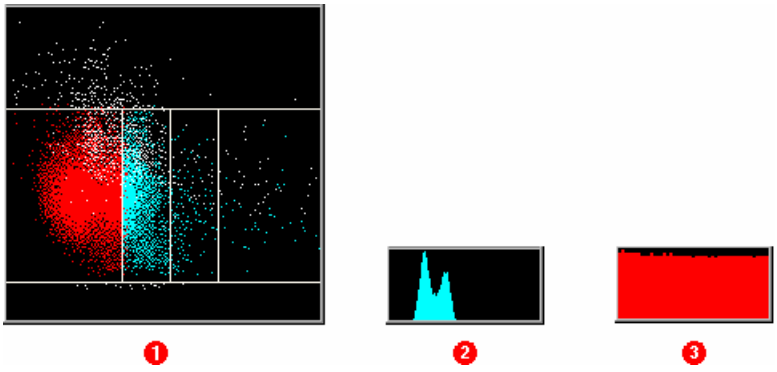
Corrective Action

Laser oscillation (mode hopping)

Laser oscillation (also called mode hopping) is defined as a change in the laser output frequency during the analysis. Typically, this condition triggers three sample/system flags.

- RETIC Fit Suspect flag (RTC-FS) is triggered due to the bimodal absorption populations that appear on the RETIC Scatter Absorption cytogram (**1**) and the RETIC Absorption histogram (**2**).
- RETIC Absorption Distribution Abnormal flag (RTCADA) is due to the bimodal absorption populations that appear on the RETIC Absorption histogram (**2**).
- RETIC Absorption Flatness flag (RTC-FL) is triggered due to the large variation in absorption signals that appears on the RETIC ABS Flatness histogram (**3**).

In such cases, the operator must rerun the sample.



Retic Fit Suspect (RTC-FS, FC)

Definition

The Retic Fit Suspect flag is triggered if:

- There is more than a 15% difference between the mean and the mode of the Gaussian fit of the RETIC Absorption Histogram.
- The chi-square error for the Gaussian fit exceeds 80,000.

Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWg, CHDWr, MCVg, MCVr, RDWg, RDWr

Corrective Action

The following list may not contain all conditions that could cause this flag, nor is there any intention to associate the flag with specific diagnoses.

- Transfusion
- Sickle cell anemia
- Excessive NRBCs

Retic Irregular Flow Rate (RTCIFR, CR)

Definition

The Retic Irregular Flow Rate flag is triggered if the cell counting rate is erratic due to a hydraulic disturbance in the retic channel.

Retic flow rate is evaluated in terms of the cell counting rate:

$$\text{Flow Uniformity} = \sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$$

The flag is triggered if this value is greater than 3.2.

The Retic Rate histogram displays the arrival rate of cells in the retic channel.

Normal Retic Rate Histogram



RTCIFR Retic Rate Histogram



Results Flagged

%RETIC, #RETIC

Corrective Action

1. Check retic reagents.
2. Check laser sample delivery.
3. Check retic hydraulics.

4. Check sheath delivery.

5. Check the pressure and vacuum readings.

A partially clogged RBC/baso/retic sheath filter can produce a distinctive “ski slope” effect on the RBC, Baso, and Retic flow rate histograms. Replace the sheath filter.

RBC Rate



Baso Rate



Retic Rate



Retic Noise Origin (RTC-NO, NO)

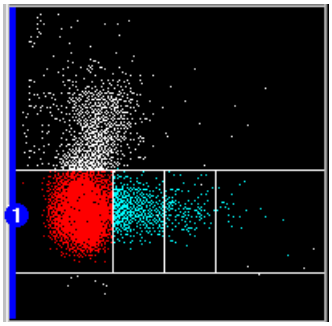
Definition

The Retic Noise Origin flag is triggered if more than 10% of the gated cell signals come from the Noise Origin area of the RETIC Scatter Absorption cytogram.

The Origin Noise area of the Retic Scatter Abs cytogram is located in absorption channels 1 through 3.

Typically, an excessive number of events detected in this area is due to unsphered cells or improperly set gains.

Normal Retic Scatter Abs Cytogram



1 Noise Origin area

Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check delivery of the sheath reagent.
2. Check delivery of SHEATH/RINSE.
3. Check the RBC/Baso/Retic hydraulics, including the reaction chamber.
4. Check the retic hydraulics.
5. Check retic gains.

Sample Related

- High platelet count
- RBC fragments
- Aged blood
- Sickle cell anemia

Retic RBC Count Low (RTC-L, CL)

Definition

The Retic RBC Count Low flag is triggered if the number of cells analyzed is less than 10,000.

Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Insufficient sample
2. Incorrect open-tube sampler probe length
3. Replace the clot filter
4. Check the retic hydraulics.

Sample Related

- Anemia

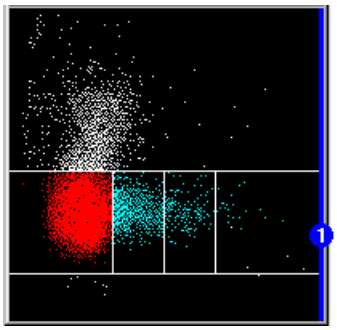
Retic Saturation (RTCSAT, CS)

Definition

The Retic Saturation flag is triggered if the events counted in the Saturation Cell area of the Retic Scatter Absorption cytogram are more than 10% of the gated cell signals.

The Saturated Cells area of the Retic Scatter Absorption cytogram is located in absorption channels 94 through 100.

Normal
Retic Scatter Abs cytogram



1 Saturation area

Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

Corrective Action

Multiple occurrences of this flag, especially for consecutive samples, can indicate a system problem. However, isolated instances of this flag are usually sample related.

The following list of sample-related causes may not contain all conditions that could cause this flag. There is no intention to associate the flag with specific diagnoses.

System Related

1. Check delivery of the sheath reagent.
2. Check delivery of SHEATH/RINSE.
3. Check the RBC/Baso/Retic hydraulics.
4. Check the retic hydraulics.
5. Check retic gains.

Sample Related

- Immature reticulocytes or neonatal (NRBCs)
- High WBCs

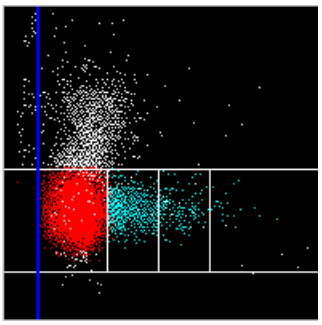
Retic Slope Error (RTC-SE, SE)

Definition

The Retic Slope Error flag is triggered if the slope of the negative cell population on the absorption axis is greater than 0.2 before the slope correction is applied.

The negative cell population should appear parallel to the y axis on the RETIC Scatter Absorption cytogram. Signals will not gate properly if they exhibit a backward or forward tilt.

Normal
Retic Scatter Abs Cytogram



Results Flagged

%RETIC, #RETIC, CHg, CHr, CHCMg, CHCMr, CHDWr, CHDWg, MCVg, MCVr, RDWg, RDWr

Corrective Action

The following list may not contain all conditions that could cause this flag, nor is there any intention to associate the flag with specific diagnoses.

- Aged blood
- Sickle cell anemia

Suspect Cellular Interference (NRCELL, NC)

Definition

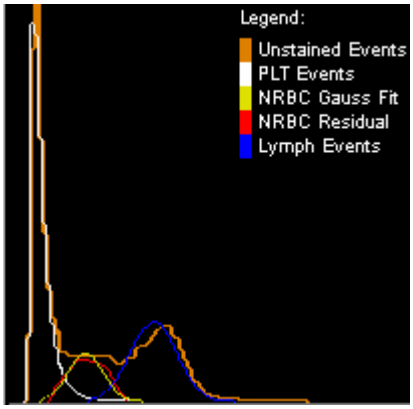
The Suspect Cellular Interference flag is triggered by of the possible presence of unlysed red blood cells. The flag is raised when the Peroxidase channel WBC count (WBCP) is greater than the Basophil/Lobularity WBC count (WBCB) by more than the specified limit.

Results Flagged

#NRBC, %NRBC, WBC, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %BASO, #BASO, %LUC, #LUC

Both the NRBC Enumeration histogram and Noise-lymph histogram often show no valley separating Noise events from the nRBC population or the nRBCs from lymphocytes.

NRBC Enumeration Histogram



Noise-Lymph Histogram



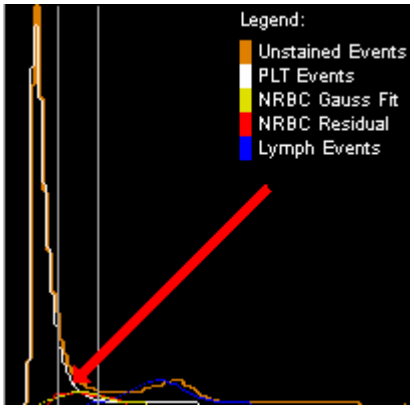
Suspect Large Plt Interference (NRLPLT, NP)

The Suspect Large Plt Interference flag is triggered if the system counts more than 40,000 large platelets /µL in the RBC/PLT channel.

Results Flagged

#NRBC, %NRBC, WBC, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %BASO, #BASO, %LUC, #LUC

NRBC Enumeration Histogram



Large platelets may obscure the nRBC population as shown to the left.

Suspect Lipid Interference (NR-LPD, NL)

Definition

The Suspect Lipid Interference flag is triggered if the number of signals in the noise region of the Basophil/Lobularity Channel exceeds a specified limit when the system reports an NRBC count.

The NR-LPD flag is triggered when both of the following conditions occur:

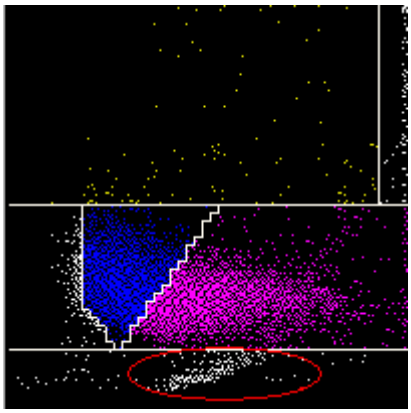
- BASO % Noise > 2
- BASO % Noise x WBCB > 10

Results Flagged

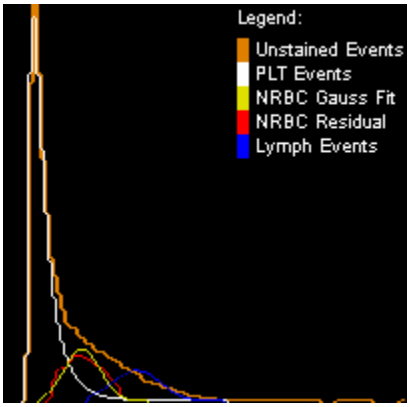
#NRBC, %NRBC, WBC, %NEUT, #NEUT, %LYMPH, #LYMPH, %MONO, #MONO, %EOS, #EOS, %BASO, #BASO, %LUC, #LUC

The Baso cytogram and NRBC Enumeration Histogram below illustrate the NR-LPD flag. The circled area of the Baso cytogram identifies the lipid pattern.

Baso Cytogram



NRBC Enumeration Histogram



WBC Substitution (WBCSUB, WS)

The WBC substitution rules for CBC / DIFF samples are as follows:

- WBCB is reported as the WBC count if there is no BASO Noise (B-NO) or BASO Saturation (B-SAT) flag.
- If WBCB is flagged with NB or BSAT, then WBCP is substituted as the WBC count if the WBCP is not flagged with:
 - No Valley Perox (PX-NV),
 - Perox Saturation (PX-SAT)
 - Noise Perox (PX-NO)
- If both WBCB and WBCP are flagged, then WBCB is flagged and reported as the WBC count.
- If WBCB is less than 1000 cells/µL, the WBCP count is not substituted as the WBC count. The WBCB count is reported as the WBC count and is flagged.

Status-Line Messages

% **3**

2 **3**

4 **4**

5 **6**

8 **6**

9 **6**

A **7**

B **39**

C **42**

D **46**

E **47**

F **49**

G **49**

H **50**

I ERROR! BOOKMARK NOT DEFINED.

J **58**

K **58**

L **58**

M **60**

N **61**

O **67**

P **68**

Q **80**

R **80**

S **88**

T **94**

U **95**

V **97**

W **99**

X **100**

Y **100**

Z **100**

%

% Disk Space Used - Alarm

Disk space used has risen to the level specified as an alarm criterion, indicating available disk space is low.

Corrective Action

Increase available disk space by deleting data from any of these files:

- Raw Data files
- Export files
- Sample Results (use Customize, System Setup, Tools Modify, End of Day)
- Logs: Message Log, Service Log, User Notepad, Reagent Log, Workload Log

IMPORTANT
Deleting files permanently erases data. If you need an electronic copy of the data, back up or export the files before deleting.

% Disk Space Used - Stop

Disk space used has risen to the level specified as the stop criterion, and the autosampler has halted. If stop/alarm criteria are not configured, the default level value is set to 98%.

Corrective Action

Increase available disk space by deleting data from any of these files:

- Raw Data files
- Export files
- Sample Results (use Customize, System Setup, Tools Modify, End of Day)
- Logs: Message Log, Service Log, User Notepad, Reagent Log, Workload Log

IMPORTANT
Deleting files permanently erases data. If you need an electronic copy of the data, back up or export the files before deleting.

2

20 PSI Out of Range

System pressure is out of range.

Possible Cause	Corrective Action
1 PSI pressure gauge is out of range	Check the 20 PSI gauge and adjust the regulator if necessary. Setpoint: 20 PSI ± 1.
2 Pressure leak	Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary.

20 PSI Out of Range - Stop

System pressure is out of range. The system has stopped because the pressure has reached a critical level that may affect the integrity of sample results and damage the system.

Possible Cause	Corrective Action
1 PSI pressure gauge is out of range	Check the 20 PSI gauge and adjust the regulator if necessary. Setpoint: 20 PSI ± 1.
2 Pressure leak	Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary.

IMPORTANT
If problems persist, Call Siemens Service for assistance. Further corrective action must be taken by Siemens service personnel only.

4

4 Key Not Found

The Control Dictionary or the Alarm Dictionary is empty. If the Alarm Dictionary is empty, sample/system flags will appear as exclamation points (!).

Possible Cause	Corrective Action
1 The Data Manager received a sample that is identified as a control but that has not been set up in the **Control Dictionary**.	Do not use control ID labels on samples, or set up the control in the **Control Dictionary**.
2 The **Alarm Dictionary** is empty or missing the Delta Check alarm. The Delta Check alarm must be in the **Alarm Dictionary** even if you do not use delta checking.	Enter alarms in the **Alarm Dictionary**.

4 Key Not Found - TestDic.dat - ReadTestCode_08

Some samples in the database contain a test that has been deleted from the Test Dictionary.

Corrective Action

In the Order Entry window, delete these samples to avoid this error. Do not modify the Test Dictionary while samples remain in the database.

40 PSI Out of Range

System pressure is out of range.

Possible Cause	Corrective Action
1 40 PSI pressure gauge is out of range	Check the 40 PSI gauge and adjust the regulator if necessary. Setpoint: 40 PSI ± 2.
2 Pressure leak	Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary.

40 PSI Out of Range -Stop

System pressure is out of range. The system has stopped because the pressure has

reached a critical level that may affect the integrity of sample results and damage the system.

Possible Cause	Corrective Action
1 40 PSI pressure gauge is out of range	Check the 40 PSI gauge and adjust the regulator if necessary. Setpoint: 40 PSI ± 2.
2 Pressure leak	Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary.

IMPORTANT

If problems persist, Call Siemens Service for assistance. Further corrective action must be taken by Siemens service personnel only.

5

5 PSI Out of Range

System pressure is out of range.

Possible Cause		Corrective Action
1	5 PSI pressure gauge is out of range	Check the 5 PSI gauge and adjust the regulator if necessary. Setpoint: 5 PSI ± 0.5
2	Pressure leak	Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary.

5 PSI Out of Range - Stop

System pressure is out of range. The system has stopped because the pressure has reached a critical level that may affect the integrity of sample results and damage the system.

Possible Cause		Corrective Action
1	5 PSI pressure gauge is out of range	Check the 5 PSI gauge and adjust the regulator if necessary. Setpoint: 5 PSI ± 0.5
2	Pressure leak	Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary.

IMPORTANT
If problems persist, Call Siemens Service for assistance. Further corrective action must be taken by Siemens service personnel only.

8

80 Conflict

A conflict has occurred on a sample that was accessed by two different tasks (for example, Review and Edit and Host Communication), or you attempted to access a sample at the same time the Data Manager was attempting to access the sample.

Corrective Action

Wait and access the sample again a few seconds later.

9

9 End of File

The Control Dictionary is empty. Quality Control cannot be operated.

Corrective Action

Define at least one QC file in the Control Dictionary window.

A

A Defined File in Prg.par Is Not Found for Backup

A file is missing that has been defined in the list of programs to be saved when running the Program backup through the End of Day functions.

Corrective Action

Call Siemens Service for assistance.

Analyzer Connected

The computer has connected with the analyzer.

Analyzer Not Connected

The computer has not connected with the analyzer.

	Possible Cause	Corrective Action
1	The analyzer is not on.	Select **On** at the analyzer touchpad.
2	Faulty or disconnected Ethernet cable (from the analyzer - J2 Workstation connection to the computer).	Verify that the Ethernet cable connection is secure. Replace if necessary.
3	Faulty analyzer CPU board or network interface PC board.	Call Siemens Service for assistance.

Analyzer Not Ready

The analyzer cannot start sample aspiration or hydraulic cycles.

	Possible Cause	Corrective Action
1	The SHEATH/	Replace the SHEATH/RINSE reagent.

	RINSE reagent container is empty.	
2	The waste container is full.	Empty the waste container.
3	Pressure or vacuum levels are out of range.	**a** Verify that the vacuum and pressure readings are within range. Adjust as necessary. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.

Analyzer Reset Required

A critical system failure has occurred and an analyzer reset is required.

Possible Cause	Corrective Action
Potential hardware failure associated with at least one of these components: Motor node, pressure node, parallel node, switch indicator, or selector valve	**1** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **2** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **a** Select **Shut Down ADVIA** at the Log On/Off window. **b** Select **Off** on the analyzer touchpad. **c** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **d** Restart the analyzer by selecting **On** at the analyzer touchpad.

Analyzer/Computer Not Connected

Communications between the analyzer and the computer have been interrupted.

Possible Cause	Corrective Action
1 Power failure at the analyzer.	Select **Off** on the analyzer touchpad and verify that the power plug is connected and secure. Reconnect if necessary and select **On** at the analyzer touchpad.
2 Faulty or disconnected Ethernet cable (from the analyzer - J2 Workstation connection to the computer).	Verify that the Ethernet cable connection is secure. Replace if necessary.
3 The computer networking configuration has been corrupted.	Follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer, and then restart: **a** Select **Shut Down ADVIA** in the Log On/Off window. **b** Select **Off** at the analyzer touchpad. **c** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **d** Restart the analyzer by selecting **On** at the analyzer touchpad. **e** If the problem persists, call Siemens Service for assistance.

Anisocytosis - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Anisocytosis - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Aspiration Failed - Probe Clog - Alarm

Conductivity detectors did not detect a sample within the 20 seconds of aspiration. The number of consecutive occurrences of this condition has met the criterion set for an alarm message.

Possible Cause		Corrective Action
1	Clogged sample.	Check for sample clots.
2	Insufficient sample volume. Sample tube may have been removed before aspiration was complete.	Re-aspirate sample.
3	Insufficient vacuum.	Check vacuum gauge and adjust if necessary.
4	Clogged clot filter.	Remove clot filter and discard as biohazardous material. Replace clot filter.
5	Loose connection in sample line.	Check connections and tighten if necessary.
6	Clog in needle.	Perform a needle rinse. Select **Utilities** menu, **Hydraulic Functions** tab, **Needle Rinse**.
7	Bent or damaged needle.	Replace the needle. Follow the steps in Replacing the Sampler Needles.
8	Faulty Conductivity Detector	Contact your Siemens Field Service representative for assistance.

Aspiration Failed - Probe Clog - Stop

Conductivity detectors did not detect a sample within the 20 seconds of aspiration. The number of consecutive occurrences of this condition has met the criterion set for a stop message.

Possible Cause		Corrective Action
1	Clogged sample.	Check for sample clots.
2	Insufficient sample volume. Sample tube may have been removed before aspiration was complete.	Re-aspirate sample.
3	Insufficient vacuum.	Check vacuum gauge and adjust if necessary.

4	Clogged clot filter.	Remove clot filter and discard as biohazardous material. Replace clot filter.
5	Loose connection in sample line.	Check connections and tighten if necessary.
6	Clog in needle.	Perform a needle rinse. Select **Utilities** menu, **Hydraulic Functions** tab, **Needle Rinse**.
7	Bent or damaged needle.	Replace the needle. Follow the steps in **Replacing the Sampler Needles.**
8	Faulty Conductivity Detector	Contact your Siemens Field Service representative for assistance.

Aspiration Paused

The analyzer is unable to perform a sample aspiration or to start a hydraulic cycle when certain menus or tabs are open or when certain error messages are triggered. Also the green ready-to-aspirate light is off.

	Possible Cause	Corrective Action
1	Aspiration is paused while the following menus or tabs are selected: **Reagent Installation**, **Backup/Restore**, **System Setup**, **Tools Modify**, or with the triggering of some error messages.	Select any tab or menu button other than the ones identified at left under Possible Cause.
2	Critical system error occurred, transferring the current system state to "Aspiration Paused."	Refer to the associated error message for appropriate corrective action steps.

Atypical Lymphocytes - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Atypical Lymphocytes - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Auto Rinse - Started

The Auto Rinse started on schedule.

Auto Rinse Canceled

The System canceled the scheduled Auto Rinse in accordance with user cancellation.

Auto Rinse Missed

The scheduled Auto Rinse was missed and did not occur while the Exerciser or System Setup tab was open.

Auto Standby - Started

The Auto Standby started on schedule.

Auto Standby Canceled

The System canceled the scheduled Auto Standby in accordance with user cancellation.

Auto Standby Missed

The scheduled Auto Standby was missed and did not occur while the Exerciser or System Setup tab was open.

Auto Startup - Exiting Standby

The System moved from Standby to Ready-to-Run, enabling the scheduled Auto Startup.

Auto Startup - Started

Auto Startup has begun on schedule.

Auto Startup Canceled

The System canceled the scheduled Auto Startup in accordance with user cancellation.

Auto Startup is Due - Will Start at End of Run

The scheduled Auto Startup will begin at the end of sample processing or hydraulic cycles.

Auto Startup Missed

The scheduled Auto Startup was missed and did not occur while the Exerciser or System Setup tab was open.

Auto System Wash - Exiting Standby

The System moved from Standby to Ready-to-Run, enabling the scheduled Auto System Wash.

Auto System Wash Canceled

The System canceled the scheduled Auto System Wash in accordance with user cancellation.

Auto Wash - Started

The Auto System Wash started on schedule.

Auto Wash is Due - Will Start at End of Run

The scheduled Auto System Wash will begin at the end of sample processing or hydraulic cycles.

Auto Wash Missed

The scheduled Auto System Wash was missed and did not occur while the Exerciser or System Setup tab was open.

autoRETIC Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

autoRETIC Reagent Expired

Present date is beyond the autoRETIC reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

autoRETIC Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

Autosampler - Access Door Open

The autosampler access door is open (24V interlock switch is open).

Corrective Action

1. Close the autosampler access door. The autosampler resets.
2. If the problem persists, call Siemens Service for assistance.

Autosampler - Autosampler is Already Running

The autosampler received a command to start or eject racks while it was running.

Autosampler - Bad Mixer Aspiration Cal

Mixer-aspiration calibration failed in diagnostic mode (Exerciser tab).

 **CAUTION**

Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take these corrective actions.

Possible Cause	Corrective Action
1 Autosampler calibration error.	Calibrate mixer aspirate position again.
2 Autosampler CPU board failed to store calibration data in flash memory.	Replace autosampler CPU board.

Autosampler - Bad Mixer Shuttle Cal

Mixer shuttle/index calibration failed in diagnostic mode (Exerciser tab).

 **CAUTION**

Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take these corrective actions.

Possible Cause	Corrective Action
1 Autosampler calibration error.	Calibrate mixer shuttle/index position again.
2 Autosampler CPU board failed to store calibration data in flash memory.	Replace autosampler CPU board.

Autosampler - Calibration Required

To start the analyzer, initial calibration values for the Car Index position, Mixer Shuttle position and the Mixer Aspirate position must be stored in flash memory.

CAUTION

Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take these corrective actions.

Possible Cause	Corrective Action
1 Autosampler CPU board contains new, unprogrammed flash memory.	Using Exerciser tab, calibrate **Car Index** position, **Mixer-Shuttle** position, and **Mixer-Aspirate** position.
2 Flash memory has lost the stored values.	Using Exerciser tab, calibrate **Car Index** position, **Mixer-Shuttle** position, and **Mixer-Aspirate** position.

Autosampler - Car Alignment Error, Reset Autosampler

The autosampler car is out of alignment. A reset is required.

Corrective Action

1. Open the autosampler access door.
2. Close the autosampler access door. The autosampler resets.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Car Initialization Failed, Reset Autosampler

The autosampler car has failed to initialize properly. A reset is required.

Corrective Action

1. Open the autosampler access door.
2. Close the autosampler access door. The autosampler will reset.
3. If the problem persists, press the Off button on the analyzer touchpad.
4. Wait about 1 minute and press the On button to restart the analyzer.
5. If the problem persists, call Siemens Service for assistance.

Autosampler - Car Lost Steps, Reset Autosampler

The autosampler car is not in the expected position. A reset is required.

Possible Cause	Corrective Action
1 Car movement problem.	**a** On the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
2 Persistent car movement problem causing binding and excessive drag on the racks.	**CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take these corrective actions. **a** Using the Autosampler window of the **Exerciser** tab, move the mixer to the Home position. **b** Manually move a rack from the input shuttle, through the mixer, to the output shuttle. Check for binding and excessive drag when moving the rack. **c** Perform the mixer alignment procedure as necessary.

Autosampler - Car Motion Denied

To prevent the collision of autosampler components, the system did not execute the command to move the autosampler car.

Autosampler - Car Motion Denied, Reset Autosampler

The autosampler attempted an inappropriate car motion. An autosampler reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Car Motion Failed, Reset Autosampler

The autosampler car has failed to move properly. A reset is required.

Corrective Action

1. Open the autosampler access door.
2. Close the autosampler access door. The autosampler resets.

3 If the problem persists, select **Off** ay the analyzer touchpad.

4 Wait about 1 minute and select **On** to restart the analyzer.

5 If the problem persists, call Siemens Service for assistance.

Autosampler - Centering Collar Extend Denied

To prevent the collision of autosampler components, the system did not execute the command to extend the autosampler centering collar.

Autosampler - Centering Collar Failed to Extend, Reset Autosampler

The autosampler centering collar failed to extend properly.

Possible Cause	Corrective Action
1 Critical Sampler Error. Partial Reset is required.	a Open the autosampler access door. b Close the autosampler access door. The autosampler will reset.
2 Critical Sampler Error. Full Reset is required.	a At the analyzer touchpad, select **Off**. b Wait about 1 minute and select **On** to restart the analyzer. c If the problem persists, call Siemens Service for assistance.
3 Air lines supplying the centering collar are pinched.	a Open the autosampler access door. b Check for kinked or pinched tubing. Replace if necessary. c Close the autosampler access door. The autosampler will reset. d If the problem persists, call Siemens Service for assistance.
4 Faulty output-queue sensor or wiring.	Call Siemens Service for assistance.

Autosampler - Centering Collar Failed to Retract, Reset Autosampler

The autosampler centering collar failed to retract properly.

Possible Cause	Corrective Action
1 Critical Sampler	a Open the autosampler access door.

	Error. Partial Reset is required.	**b** Close the autosampler access door. The autosampler will reset.
2	Critical Sampler Error. Full Reset is required.	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
3	Air lines supplying the centering collar are pinched.	**a** Open the autosampler access door. **b** Check for kinked or pinched tubing. Replace if necessary. **c** Close the autosampler access door. The autosampler will reset. **d** If the problem persists, call Siemens Service for assistance.
4	Faulty output-queue sensor or sensor wiring.	Call Siemens Service for assistance.

Autosampler - Collar Failed to Extend, Reset Autosampler

The autosampler centering collar failed to extend properly.

Possible Cause		Corrective Action
1	Critical Sampler Error. Partial Reset is required.	**a** Open the autosampler access door. **b** Close the autosampler access door. The autosampler will reset.
2	Critical Sampler Error. Full Reset is required.	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
3	Air lines supplying the centering collar are pinched.	**a** Open the autosampler access door. **b** Check for kinked or pinched tubing. Replace if necessary. **c** Close the autosampler access door. The autosampler will reset. **d** If the problem persists, call Siemens Service for

		assistance.
4	Faulty output-queue sensor or wiring.	Call Siemens Service for assistance.

Autosampler - Collar Failed to Retract, Reset Autosampler

The autosampler centering collar failed to retract properly.

Possible Cause		Corrective Action
1	Critical Sampler Error. Partial Reset is required.	**a** Open the autosampler access door. **b** Close the autosampler access door. The autosampler will reset.
2	Critical Sampler Error. Full Reset is required.	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
3	Air lines supplying the centering collar are pinched.	**a** Open the autosampler access door. **b** Check for kinked or pinched tubing. Replace if necessary. **c** Close the autosampler access door. The autosampler resets. **d** If the problem persists, call Siemens Service for assistance.
4	Faulty output-queue sensor or wiring.	Call Siemens Service for assistance.

Autosampler - Centering Collar Motion Denied, Reset Autosampler

The autosampler attempted an inappropriate centering collar motion. An autosampler reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Centering Collar Retract Denied

To prevent the collision of autosampler components, the system did not execute the command to retract the autosampler centering collar.

Autosampler - Critical Error, Reset Autosampler

Critical autosampler error. A reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Diagnostic Mode Not In Effect

The analyzer sent a diagnostic command to the autosampler while the autosampler was in operating mode.

Corrective Action

1. Open the **Autosampler** window of the Exerciser tab.
2. Select **Enter Diagnostic Mode**.

Autosampler - Eject Rack Failed

The autosampler failed to respond to the eject rack command and is not clearing racks from the mixer and input and output shuttles.

Possible Cause	Corrective Action
1 Command from analytical module not received by autosampler.	a At the analyzer touchpad, select **Off**. b Wait about 1 minute and select **On** to restart the analyzer. c If the problem persists, call Siemens Service for assistance.
2 All communication between the autosampler and the analyzer may be down.	See **1a, b, c**
3 Autosampler operation may be down.	See **1a, b, c**

Autosampler Error - Reason Unknown

Unknown autosampler software error.

Corrective Action

1. At the analyzer touchpad, select **Off**.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Error, Reset Autosampler

The autosampler has experienced a software error and must be reset.

Corrective Action

1. At the analyzer touchpad, select **Off**.
2. Wait about 1 minute and pr select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Extra Rack Ejected

This message is for your information only. If the message persists, call Siemens Service for assistance.

Autosampler Failure - Stop

There has been an autosampler communication error. A reset is required.

Corrective Action

1. At the analyzer touchpad, select **Off**.
2. Wait about 1 minute and select **On** to restart the analyzer.

If the problem persists, call Siemens Service for assistance.

Autosampler - Flash Memory Failed, Reset Autosampler

The autosampler flash memory failed to respond to a routine command and might be defective. An autosampler reset is required.

Corrective Action

1. Select **Off** on the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Initialization Required

In diagnostic mode, the analyzer sent a position command before the appropriate initialization was performed. For example, a position mixer command could have been sent before a mixer initialization.

Corrective Action

Call Siemens Service for assistance.

Autosampler - Input Queue Jammed

Possible Cause	Corrective Action
1 Rack has jammed the leading edge of input-queue blade.	Remove and reset rack.
2 Queue pan motion is impeded.	Check for foreign objects in input-queue pan.
3 Feed motor failed.	Call Siemens Service for assistance.

Autosampler - Input Queue Motion Denied

To prevent the collision of autosampler components, the system did not execute the command to move the autosampler input queue.

Autosampler - Input Queue Motion Denied, Reset Autosampler

The autosampler attempted an inappropriate input queue motion. An autosampler reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Input Queue Motion Failed

The autosampler input queue failed to move properly.

Possible Cause	Corrective Action
1 Rack has	

	jammed the leading edge of the input-queue blade.	**a** Remove and replace rack. **b** Select **Start** at the analyzer touchpad. The autosampler resumes operation.
2	Queue pan cannot move properly.	Check the queue pan for foreign objects.
3	Feed motor has failed.	Call Siemens Service for assistance.

Autosampler - Input Queue Motion Failed, Reset Autosampler

The autosampler input queue failed to move properly. An autosampler reset is required.

	Possible Cause	Corrective Action
1	Rack has jammed the leading edge of the input-queue blade.	**a** Remove and replace rack. **b** Select **Start** on the analyzer touchpad. The autosampler resumes operation. If the autosampler does not start: **a** Select **Off** at the analyzer touchpad. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
2	Queue pan cannot move properly.	Check the queue pan for foreign objects.
3	Feed motor has failed.	Call Siemens Service for assistance.

Autosampler - Input Shuttle Blocked

A rack in the input-shuttle position is preventing the autosampler from completing a movement.

	Corrective Action
1	Remove the rack from the shuttle position at the front of the input queue.
2	Select **Start** at the analyzer touchpad to restart autosampler operation.

Autosampler - Input Shuttle Not Empty

A rack in the input-shuttle position is preventing the autosampler from completing a movement.

Corrective Action

1. Remove the rack from the shuttle position at the front of the input queue.
2. Select **Start** at the analyzer touchpad to restart autosampler operation.

Autosampler - Internal Communication Failure

During normal operation, the autosampler detected an internal, software-level communication failure. This caused the autosampler to stop operation.

Corrective Action

1. At the analyzer touchpad, select **Off**.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Invalid Operation Mode, Reset Autosampler

The autosampler was unable to carry out a requested motion. The autosampler might not be in the correct mode.

Corrective Action

1. At the analyzer touchpad, select **Off**.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Invalid Sequence Number

The autosampler sent the analyzer a sample ID sequence number that did not match the expected sequence number.

Possible Cause	Corrective Action
1 The autosampler performed two index operations, but no aspiration.	a At the analyzer touchpad, select **Off**. b Wait about 1 minute and select **On** to restart the analyzer. c If the problem persists, call Siemens Service for assistance.
2 The message sent from the autosampler to the analyzer did not contain	See **1a, b, c**

the sample ID sequence number expected for the tube in the current rack position.

Autosampler - Mechanical Constraint

To prevent the collision of autosampler components, the system did not execute the requested action.

Autosampler - Mixer Failed

The autosampler mixer failed and may be defective.

Corrective Action

1. On the analyzer touchpad, select **Off**.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Mixer Lost Steps, Reset Autosampler

The autosampler mixer is not in the expected position. A reset is required.

Possible Cause	Corrective Action
1 Car movement problem.	a At the analyzer touchpad, select **Off**. b Wait about 1 minute and select **On** to restart the analyzer. c If the problem persists, call Siemens Service for assistance.
2 Persistent car movement problem causing binding and excessive drag on the racks.	**CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take these corrective actions. a Perform the mixer alignment procedure as necessary. b Check pushpin and centering collar operation when the mixer is in the aspirate position. c Check for signs of excessive friction in the mixer bearings.

Autosampler - Mixer Motion Denied, Reset Autosampler

The autosampler attempted to perform an inappropriate mixer motion. An autosampler reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Mixer Motion Failed, Reset Autosampler

The autosampler failed to perform a routine mixer motion during normal rack processing. A reset is required.

Possible Cause	Corrective Action
1 Critical autosampler error.	a At the analyzer touchpad, select **Off**. b Wait about 1 minute and select **On** to restart the analyzer. c If the problem persists, call Siemens Service for assistance.
2 Mixer is blocked by a foreign object.	a Open the autosampler access door. b Remove any foreign objects that might block mixer motion. c Close the autosampler access door. The autosampler will reset.
3 Mixer home sensor is faulty.	Call Siemens Service for assistance.
4 Mixer motor power cable is not properly connected or is faulty.	Call Siemens Service for assistance.

Autosampler - Mode of Operation Not Set

The autosampler was unable to carry out a requested motion while the system was in the Exerciser tab.

Corrective Action

In the **Exerciser** tab, set the autosampler to the correct mode for the operation you want to perform. You may have to reset the autosampler before proceeding.

To reset the autosampler

1 At the analyzer touchpad, select **Off**.

2 Wait about 1 minute and select **On** to restart the analyzer.

3 If the problem persists, call Siemens Service for assistance.

Autosampler - Motion Denied, Reset Autosampler

The autosampler has failed to execute a command to move and must be reset.

Corrective Action

1 At the analyzer touchpad, select **Off**.

2 Wait about 1 minute and select **On** to restart the analyzer.

3 If the problem persists, call Siemens Service for assistance.

Autosampler - Motion Request Failed, Reset Autosampler

The autosampler failed to perform a requested motion and might be defective. An autosampler reset is required.

Corrective Action

1 Select **Off** at the analyzer touchpad.

2 Wait about 1 minute and select **On** to restart the analyzer.

3 If the problem persists, call Siemens Service for assistance.

Autosampler - Motor Controller Failed, Reset Autosampler

The autosampler motor controller failed to respond to a routine command and might be defective. An autosampler reset is required.

Corrective Action

1 Select **Off** on the analyzer touchpad.

2 Wait about 1 minute and select **On** to restart the analyzer.

3 If the problem persists, call Siemens Service for assistance.

Autosampler - Needle Extend Denied

To prevent the collision of autosampler components, the system did not execute the command to extend the autosampler needle.

Autosampler - Needle Failed to Extend, Reset Autosampler

The autosampler needle failed to extend properly.

Possible Cause	Corrective Action
1 Critical Sampler Error.	**a** Open the autosampler access door. **b** Close the autosampler access door. The autosampler will reset. **c** If the problem persists, select **Off** on the analyzer touchpad. **d** Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
2 40 PSI line is out of range.	**a** Check pressure and adjust if necessary. **b** Check for pinched air lines supplying needle cylinder. **c** On the analyzer touchpad, select **Off**. **d** Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
3 Needle is bent.	Replace needle.
4 Needle sensor failed.	Call Siemens Service for assistance.

Autosampler - Needle Failed to Retract, Reset Autosampler

The autosampler needle failed to retract properly.

Possible Cause	Corrective Action
1 Critical Sampler Error.	**a** Open the autosampler access door. **b** Close the autosampler access door. The autosampler will reset. **c** If the problem persists, select **Off** at the analyzer touchpad. **d** Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
2 40 PSI line is out of range.	**a** Check pressure and adjust if necessary. **b** Check for pinched air lines supplying needle

		cylinder. **c** At the analyzer touchpad, select **Off**. **d** Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
3	Needle is bent.	Replace needle.
4	Needle sensor failed.	Call Siemens Service for assistance.

Autosampler - Needle Jammed

The needle failed to extend or retract during sample aspiration.

Possible Cause		Corrective Action
1	40 PSI line out of range.	**a** Check pressure and adjust if necessary. **b** Check for pinched air lines supplying needle cylinder. **c** At the analyzer touchpad, select **Off**. **d** Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
2	Needle sensor failed.	Call Siemens Service for assistance.

Autosampler - Needle Motion Denied, Reset Autosampler

The autosampler attempted an inappropriate needle motion. An autosampler reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Needle Retract Denied

To prevent the collision of autosampler components, the system did not execute the command to retract the autosampler needle.

Autosampler - No Tube Present

Pushpin cannot find tube in current rack position. Rack spring clip is broken and holds tube incorrectly.

Corrective Action

Remove rack and check spring clip.

Autosampler - Operating Mode Not in Effect

The autosampler is not in operating mode.

Corrective Action

1. Open the **Autosampler** window of the Exerciser tab .
2. Exit the **Exerciser** tab by opening another tab.

Autosampler - Output Queue Full

Possible Cause	Corrective Action
1 Output queue and/or output shuttle are full.	Remove racks from output queue and/or output shuttle.
2 Output queue sensor, ribbon cable, or autosampler CPU board is faulty.	**CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take these corrective actions: **a** Check output-queue sensor and sensor wiring. **b** Make sure pressing output-queue sensor flag triggers sensor. **c** Make sure output-queue ribbon is plugged in securely. **d** Replace autosampler CPU board.

Autosampler - Output Queue Jammed

The output queue is jammed.

Possible Cause	Corrective Action
1 Leading edge of the output-queue pan blade spears rack.	Remove racks from output queue and/or output shuttle.
2 Output-queue motion impeded.	**a** Check for foreign objects in output queue, queue covers, or pinch guard. **b** Make sure output queue moves freely.
3 Feed-motor failure.	Call Siemens Service for assistance.

Autosampler - Output Queue Motion Denied

To prevent the collision of autosampler components, the system did not execute the command to move the autosampler output queue.

Autosampler - Output Queue Motion Failed

The autosampler output queue failed to move properly.

Possible Cause	Corrective Action
1 Leading edge of the output-queue blade has speared a rack.	**a** Remove racks from output queue and shuttle. **b** Select **Start** at the analyzer touchpad. The autosampler resumes operation.
2 Queue cannot move properly.	Check the output queue, queue covers, and pinch guard for foreign objects. Make sure the queue moves freely.
3 Feed motor has failed.	Call Siemens Service for assistance.

Autosampler - Output Shuttle Blocked

A rack in the output-shuttle position is preventing the autosampler from completing a movement.

Corrective Action
a Remove the rack from the shuttle position at the front of the output queue.
b Select **Start** at the analyzer touchpad to restart autosampler operation.

Autosampler - Output Shuttle Failed

There is no rack in the output shuttle position at the end of shuttle motion. The probable cause is the removal of the rack by the user before the shuttle stops.

Autosampler - Output Shuttle Not Empty

The autosampler has attempted to move a rack to the output shuttle, but the shuttle is not empty.

Corrective Action

Remove rack from the output shuttle.

Autosampler - Pushpin Extend Denied

To prevent the collision of autosampler components, the system did not execute the command to extend the autosampler pushpin.

Autosampler - Pushpin Motion Denied, Reset Autosampler

The autosampler attempted an inappropriate pushpin motion. An autosampler reset is required.

Corrective Action

1. Select **Off** at the analyzer touchpad.
2. Wait about 1 minute and select **On** to restart the analyzer.
3. If the problem persists, call Siemens Service for assistance.

Autosampler - Pushpin Retract Denied

To prevent the collision of autosampler components, the system did not execute the command to retract the autosampler pushpin.

Autosampler - Pushpin Failed to Extend, Reset Autosampler

The autosampler pushpin failed to extend properly.

Possible Cause	Corrective Action
1 Pushpin is jammed.	a Open the autosampler access door. b Close the autosampler access door. The autosampler will reset. c If problem persists, select **Off** at the analyzer touchpad.

		d Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
2	Pushpin catches on the bottom of an improperly positioned rack.	**a** Check rack position in mixer. Adjust if necessary. **b** If the problem persists, call Siemens Service for assistance.
3	Pushpin catches on the bottom of the mixer.	**a** Check rack position in mixer. Adjust if necessary. **b** If the problem persists, call Siemens Service for assistance.
4	Faulty output-queue sensor or wiring.	Call Siemens Service for assistance.

Autosampler - Pushpin Failed to Retract, Reset Autosampler

The autosampler pushpin failed to retract properly.

Possible Cause		Corrective Action
1	Pushpin is jammed.	**a** Open the autosampler access door. **b** Close the autosampler access door. The autosampler will reset. **c** If problem persists, select **Off** at the analyzer touchpad. **d** Wait about 1 minute and select **On** to restart the analyzer. **e** If the problem persists, call Siemens Service for assistance.
2	Pushpin catches on the bottom of an improperly positioned rack.	**a** Check rack position in mixer. Adjust if necessary. **b** If the problem persists, call Siemens Service for assistance.
3	Pushpin catches on the bottom of the	**a** Check rack position in mixer. Adjust if necessary. **b** If the problem persists, call Siemens Service for

	mixer.	assistance.
4	Faulty output-queue sensor or wiring.	Call Siemens Service for assistance.

Autosampler - Pushpin Jammed

Pushpin is jammed and cannot extend or retract properly.

Possible Cause	Corrective Action
1 Pushpin catches on bottom of improperly positioned rack.	**a** Check and adjust rack position in mixer. **CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take this corrective action. **b** Check output-queue sensor and sensor wiring.
2 Pushpin catches on bottom surface of mixer extrusion.	**a** Check and adjust rack position in mixer. **CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take this corrective action. **b** Check output-queue sensor and sensor wiring.

Autosampler - Rack Index Failed, Reset Autosampler

The scanner has read a valid barcode that does not correspond to the expected rack or position numbers. This indicates that the rack has not moved to the proper position.

Possible Cause	Corrective Action
1 Rack movement problem.	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
2 Persistent mixer problem causing binding and excessive drag	**CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take this corrective action. **a** Using the Autosampler window of the **Exerciser** tab,

	on the racks.	move the mixer to the Home position. **b** Manually move a rack from the input shuttle, through the mixer, to the output shuttle. Check for binding and excessive drag when moving the rack. **c** Perform the mixer alignment procedure as necessary.

Autosampler - Rack or Position Barcode Not Read

The barcode reader cannot determine a valid rack ID or position number for the current tube position.

	Possible Cause	Corrective Action
1	Rack barcode label improperly placed, obscured, or absent.	Make sure the barcode label is correctly placed on the rack, is clean, and meets specifications.
2	Window of barcode reader is dirty, or line of sight is obstructed.	**a** Clean barcode reader window. **b** Make sure there is no visual obstruction between the barcode reader window and the rack. **c** If problem persists, call Siemens Service for assistance.
3	Faulty barcode reader.	Call Siemens Service for assistance.

Autosampler - Rack Scan Denied

Barcode reader is unable to scan.

	Possible Cause	Corrective Action
1	Faulty barcode reader cabling.	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
2	Faulty barcode reader.	See **1a, b, c**
3	Window of barcode reader is dirty, or line of sight is obstructed.	**a** Clean barcode reader window. **b** Make sure there is no visual obstruction between the barcode reader window and the rack. **c** If problem persists, call Siemens Service for

		assistance.
4	Rack barcode label improperly placed, obscured, or absent.	Make sure the barcode label is correctly placed on the rack, is clean, and meets specifications.

Autosampler - Rack Scan Failed

Barcode reader is unable to scan.

Possible Cause		Corrective Action
1	Faulty barcode reader cabling.	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer. **c** If the problem persists, call Siemens Service for assistance.
2	Faulty barcode reader.	See **1a, b, c**

Autosampler - Shuttle Gate Open

Input queue cannot advance the rack because the shuttle gate is not closed.

Possible Cause		Corrective Action
1	Shuttle gate only partially closed.	**a** Check for an obstruction to the shuttle gate. **b** Push the shuttle gate to check for spring resistance.
2	Faulty sensor or sensor wiring.	**CAUTION** Call Siemens Service for assistance. Only Siemens Service personnel are authorized to take this corrective action: Check sensor and associated wiring.

Autosampler - Startup Failed, Reset Autosampler

The autosampler has failed to start up. A reset is required.

	Corrective Action
1	Open the autosampler access door.

2 Close the autosampler access door. The autosampler resets.

3 If the problem persists, call Siemens Service for assistance.

Autosampler - Tube Too High

Tube is sitting too high in rack, or tube exceeds specifications, halting autosampler.

Possible Cause	Corrective Action
1 Tube is improperly positioned.	a Push tube down. b At the analyzer touchpad, select **Start/Stop** to continue operations.
2 Tube is too long.	a Remove tube from rack and aspirate manually. b At the analyzer touchpad, select **Start/Stop** to continue operations.

Autosampler Startup Complete

The autosampler has successfully completed the startup process.

Autosampler - Unexpected Car Position, Reset Autosampler

The autosampler car is not in the proper position. A reset is required.

Corrective Action

1 Open the autosampler access door.

2 Close the autosampler access door. The autosampler resets.

3 If the problem persists, call Siemens Service for assistance.

Awaiting Header

Software communication error.

Possible Cause	Corrective Action
This error can occur during the following analytical cycles: • Adjust Gains - RBC/RETIC • Align Optics	Follow these steps to exit the ADVIA 2120/2120i software and then restart: 1 Select **Shut Down ADVIA** at the Log On/Off window. 2 Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. If the problem persists, call Siemens Service for

• Direct Optics	assistance.

B

Bad Analysis for R Message :10402

The results message sent to the host is incorrect.

Corrective Action

Call Siemens Service for assistance.

Bad Analysis for Y Message :10402

The format of the received workorder is incorrect. The workorder cannot be created.

Corrective Action

Call Siemens Service for assistance.

Bad Mixer Cal Value - Reset Autosampler

Mixer-aspirate calibration failed while the system was in diagnostic mode (Exerciser).

The corrective actions for this error must be performed by Siemens Service personnel only.

Possible Cause	Corrective Action
1 Autosampler Calibration error	Calibrate the mixer aspirate position again.
2 Autosampler CPU board fails to store calibration data in flash memory	Replace autosampler CPU board.

Bad Test in Profile

An incorrect test code is defined in a profile.

Corrective Action

Correct the Profile Table using the List menu in the Table Dictionaries window.

BASO Count Suspect - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

BASO Count Suspect - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

BASO Irregular Flow Rate - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

BASO Irregular Flow Rate - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

BASO Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

BASO Reagent Expired

Present date is beyond the BASO reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

BASO Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

BASO Saturation - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

BASO Saturation - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

BASO Temperature Out - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

BASO Temperature Out - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Blasts - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Blasts - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

BTRIEVE - TabDic.dat File

The Type Table Dictionary contains the code of a profile that has been deleted.

Corrective Action

Check and correct the Type Table Dictionary. Select Customize menu, System Setup, Tools Modify, Type Table Dictionary.

C

Car Motion Failed - Reset Autosampler

The autosampler failed to move as expected.

Possible Cause	Corrective Action
Autosampler software error	**1** At the analyzer touchpad, select **Off**. **2** Wait about 1 minute and select **On** to restart the analyzer. **3** If problem persists, call Siemens Service for assistance.

Check Waste Container Vacushield

The vacuum pump filter (vacushield) on the waste container may be saturated with liquid.

Possible Cause	Corrective Action
1 Vacuum pump filter (vacushield) is clogged	Replace the vacuum pump filter.
2 Vacuum leak	**a** Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary. **b** Check the waste container to make sure that the spigot is closed and the cap is on securely.
3 Crimped waste line	Check for a crimped waste line on the waste container. Straighten or reconnect lines as necessary.

IMPORTANT

If problems persist, Call Siemens Service for assistance. Further corrective action must be taken by Siemens service personnel only.

Communications Error with Analyzer

Software communication error between the computer and the analyzer.

Possible Cause	Corrective Action
1 Internal software corruption	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer, and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 Faulty or disconnected Ethernet cable (from the analyzer - J2	Verify that the Ethernet connection is secure. Replace if necessary.

Workstation
connection to
the computer)

Comparison Error MCHC/CHCM - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Comparison Error MCHC/CHCM - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Comparison Error WBCB/WBCP - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

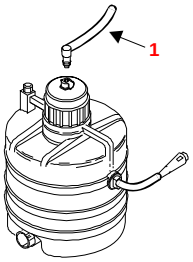
Comparison Error WBCB/WBCP - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Compressor Timeout

During system startup or when exiting standby, the compressor has failed to reach the acceptable pressure or vacuum levels within the allotted time.

Possible Cause	Corrective Action
1 System restarted too quickly after being turned off	Manually vent the waste container by disconnecting the waste container vacuum line (1), waiting for the vacuum to dissipate, and then reconnecting the line.
2 Vacuum line attached to the waste container is disconnected or crimped	**a** Reconnect or remove any crimps from the waste container vacuum lines. **b** At the analyzer touchpad, select **Off**. **c** Wait at least 1 minute and select **On** to restart the analyzer.
3 Vacuum pump filter (vacushield) is clogged	Replace the vacuum pump filter.
4 Compressor failure	Call Siemens service for assistance.



Control Out of Range - Alarm

One or more control samples have yielded out of range test results. The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria.

Control Out of Range - Stop

One or more control samples have yielded out of range test results. The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts when the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria.

Could Not Attempt Location of a Workorder, Exception Occurred

A sample workorder could not be located because of a software error.

Corrective Action

The default selectivity has been applied for the affected sample. Rerun the sample if desired.

Cycle Aborted for Unknown Reason - Reset Required

A cycle abort condition was triggered by the analyzer, but the reason given was not recognized by the computer.

Corrective Action

1. Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**.
2. After about 1 minute, if the status line does not display Ready to Run and the green ready aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer, and then restart.
 a. Select **Shut Down ADVIA** at the Log On/Off window.
 b. Select **Off** at the analyzer touchpad.
 c. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.
 d. Restart the analyzer by selecting **On** at the analyzer touchpad.

D

Data Manager Critical Error

An internal software communication error has triggered a high-level Data Manager error.

Corrective Action

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Defined More Than Once In File

Note: This message can begin with a keyword or a test code.

Possible Cause	Corrective Action
1 The same keyword is set several times in the header of the Report.par, Prevalid.par, Print.par, or QCreport.par files. No blank or presentation line can be inserted after the asterisk (*) in the result block.	Use the Format window to correct the file layout.
2 The same test code is used twice in the *.par file.	Remove the duplicate test codes from the *.par file in Tools Modify.

DEFOAMER Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

DEFOAMER Reagent Expired

Present date is beyond the DEFOAMER reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

DEFOAMER Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

E

Error Opening Port

This error can occur during the system preparation (initialization) process.

Corrective Action

Select Shut Down ADVIA in the Log On/Off window. Select CTRL+ALT+DELETE and log back onto the system to restart the software. If the error recurs, check the communication port where the problem occurs (COM 1 or MCA Serial Board).

EZ KLEEN Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

EZ KLEEN Reagent Expired

Present date is beyond the EZ KLEEN reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

EZ KLEEN Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

F

File Does Not Exist

A patient or control result printout has been selected in the Routine Parameters window. But one of the files, Report.par, Prevalid.par, Print.par, or QCreport.par, is not defined.

Corrective Action

Restore dictionaries in Other Utilities window.

File Not Found: C:\Wst\Oen.cnf

The default workorder screen configuration file is missing.

Corrective Action

Continue to create workorders in Order Entry as needed. To restore the Oen.cnf file, select Other Utilities and restore dictionaries.

File Not In Modifiable File List - Updating

This message appears when a file is created through the Format window. The file is then stored in the database.

Corrective Action

No action is required.

G

GETEQUAL

This control is not defined in the Control Dictionary.

Corrective Action

Define the control in the Control Dictionary.

GlobalLock or GlobalUnlock

The selected dispositions cannot be stored because the sample record is full.

Corrective Action

Reduce the number of dispositions selected or cancel the selections and create a new workorder through the Order Entry window.

HGB Colorimeter Error - Reset Required

Potential software communication error or a hardware failure associated with the HGB Colorimeter.

Possible Cause	Corrective Action
1 Hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 Faulty power supply, fuse, cable, HGB Interface Node Board, or Can Bus Scrambler Board	Call Siemens Service for assistance.

HGB Concentration Variance - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

HGB Concentration Variance - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

HGB Irregular Flow Rate - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

HGB Irregular Flow Rate - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

HGB Power Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

HGB Power Low - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

HGB Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

HGB Reagent Expired

Present date is beyond the HGB reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

HGB Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

Hyperchromia - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Hyperchromia - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Image Affected to Wrong Group

There is a conflict between two settings in the Customer Parameters.

The parameters in Customer Parameters §21, ASSOCIATE CBC/DIFF IMAGE WITH A TEST GROUP and ASSOCIATE RETIC IMAGE WITH A TEST GROUP, can be set only to values attached to a test group. The test groups are defined in Customer Parameters §17.

Corrective Action

1 Open **Customer Parameters** in Tools Modify mode.

2 Define the test groups in Customer Parameters §17.

3 Set the values in §21 to correspond to the test groups you have defined.

or

1 Open **Customer Parameters** in Tools Modify mode.

2 Set the values in §21 = **0**.

Immature Granulocytes - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Immature Granulocytes - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Indicator and Switch Error - Reset Required

Potential software communication error or a hardware failure associated with the front panel switch/indicator.

Possible Cause	Corrective Action
1 Hardware failure	a Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. b After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. i Select **Shut Down ADVIA** at the Log On/Off window. ii Select **Off** at the analyzer touchpad. iii Press **CTRL+ALT+DELETE** and log back onto the system to restart the software. iv Restart the analyzer by selecting **On** at

		the analyzer touchpad.
2	The cable connected to the switch/indicator is crimped.	Select **Off** at the analyzer touchpad to check for crimped cable. Free the crimped cable if necessary and restart the analyzer by selecting **On** at the analyzer touchpad.
3	Faulty power supply, fuse, Switch/Indicator board, cable, Parallel Node Board, Can Bus Scrambler Board, or Switch/Indicator panel.	Call Siemens Service for assistance.

Initialization Failed - During Communication from Analyzer

Software communication error.

Corrective Action

Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Initialization Failed - During Configuration Download

Software communication error.

Corrective Action

Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Initialization Failed - During Download of Cycle Definition

Software communication error.

Corrective Action

Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Initialization Failed - During Image Download

Software communication error.

Corrective Action
Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Initialization Failed - During OMF File Download

Software communication error.

Corrective Action
Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Initialization Failed - Waiting for Waste and Rinse Clear

During System Preparation in Progress, the SHEATH/RINSE was empty or the waste container was full.

Possible Cause	Corrective Action
1 SHEATH/RINSE empty during System Preparation.	Replace the SHEATH/RINSE reagent. The system preparation process will continue automatically.
2 Waste container full during System Preparation.	Empty the waste container and replace. The system preparation process will continue automatically.

Initialization Failed - Writing Image Download

Software communication error or possible faulty Ethernet cable (from the analyzer - J2 Workstation connection to the computer).

Corrective Action
Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, verify that the Ethernet connection is secure, and replace if necessary. If the problem recurs, call Siemens Service for assistance.

Invalid / Unknown TDC Error

An unrecognized Data Manager error has occurred.

Corrective Action

Follow these steps to exit the ADVIA 2120/2120i software and then restart:

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

If the problem persists, call Siemens Service for assistance.

Invalid Configuration, Mandatory Field Missing

The configuration file is incorrect. A mandatory field is missing.

Corrective Action

On the Screen Configuration window, correct the configuration file. Select Customize menu, System Setup, Tools Modify, Screen Configuration.

Invalid Host Test Number (=0)

A test has an improper host number defined in the Test Dictionary.

Corrective Action

Verify host number in Test Dictionary, Characteristics.

Invalid Morphology Flags Host Number: xxx

The morphology flags from the analyzer cannot be managed by the Data Manager and cannot be transmitted to the host.

Corrective Action

Call Siemens Service for assistance.

Invalid Numerical Result Format

A result edited in the Review and Edit window has a format incompatible with the communications protocol.

Corrective Action

Verify that the format shows four results of one character each.

Invalid RBC or WBC Flag

The RBC or WBC has incorrect or undefined values in the analyzer. The sample will not be transmitted to the host.

Corrective Action

Verify that the result is composed of four results of one character each.

Invalid System Number

The computer system number, as it applies to the host, is improperly defined or undefined in the parameter file.

Corrective Action

Call Siemens Service for assistance.

Invalid Test Code in Report.par File

A test code entered in the Report.par file is not valid.

Corrective Action

Correct problem using Key list in Format window.

J

K

L

Large Platelets - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Large Platelets - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Laser Power Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Laser Power Low - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Left Shift - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Left Shift - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Length of Range Field Too Long in REPORT.PAR File

The ranges have been incorrectly defined in the Report.par file.

Corrective Action

Use the Format window to correct the problem.

M

Macrocytosis - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Macrocytosis - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Manual Sample ID - Auto Increment Off

Auto increment feature has been turned off. (Use Operations, Manual Sample ID.) The sample ID for manually aspirated samples will not automatically increment by one. The sample ID must be entered by keyboard, barcode reader, or workorder.

Manual Sample ID - Auto Increment On

Auto increment feature has been selected. (Use Operations, Manual Sample ID.) The sample ID for manually aspirated samples will increment by one for each succeeding aspiration.

Matching Not Possible - Mismatch of Sample Types

The test request sent by the host and the unmatched sample are not the same type. The test request is refused and the sample remains unmatched.

Corrective Action

Verify the accuracy of the host test table. Verify type in Test Dictionary. Select Customize menu, System Setup, Tools Modify, Test Dictionary.

Microcytosis - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Microcytosis - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

MPO Deficiency - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

MPO Deficiency - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

N

NACK Received

A conflict has occurred in host communications.

Corrective Action

Call Siemens Service for assistance.

No BASO MN/PMN Valley - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

No BASO MN/PMN Valley - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

No Cell Cluster Fit on PEROX - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

No Cell Cluster Fit on PEROX - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

No Data Available in Result Message

The Data Manager cannot recognize the result types received from the analyzer.

Corrective Action

Call Siemens Service for assistance.

No Graphic Result Data in Result Message

The Data Manager cannot compress graphic results before storing them in the database.

Corrective Action

Call Siemens Service for assistance.

No Help Available for this Message

There is no Help available for this message at this time. If you cannot find sufficient information in the Operator's Guide, contact your Siemens Representative for assistance.

No Numerical Result in Result Message

The Data Manager cannot convert CBC/DIFF or Retics results into numerical or comment results.

Corrective Action

Call Siemens Service for assistance.

No PEROX Noise/Lymph Valley - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

No PEROX Noise/Lymph Valley - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

No Test

There is a message problem with the test request sent from the host.

Corrective Action

Verify that the host is sending the test request. If the problem recurs, call Siemens Service for assistance.

No Type

The type of test request sent by the host is not defined in the Test Dictionary.

Corrective Action

Verify the accuracy of the host test table. Define the test in Test Dictionary. Select Customize menu, System Setup, Tools Modify, Test Dictionary.

No Workorder - Alarm

No workorder received for current patient sample. The number of consecutive occurrences of this condition has met the criterion specified for an alarm message.

	Possible Cause	Corrective Action
1	A work order has not been created for the current patient sample.	Verify that a work order has been created at the host computer or at the Data Manager.
2	A work order has not been transmitted for the current patient sample.	Check if problem exists at the host computer. If problem is not at the host level, call Siemens Service for assistance.

No Workorder - Stop

No workorder received for current patient sample. The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler has stopped.

	Possible Cause	Corrective Action
1	A work order has not been created for the current patient sample.	Verify that a work order has been created at the host computer or at the Data Manager.
2	A work order has not been transmitted for the current patient sample.	Check if problem exists at the host computer. If problem is not at the host level, call Siemens Service for assistance.

No Working Buffer Initialized

This error can occur during the system preparation (initialization) process.

Corrective Action

Restart the ADVIA 2120/2120i software. If the error recurs, call Siemens Service for assistance.

Noise BASO - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Noise BASO - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Noise PEROX - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Noise PEROX - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Non WBC Interference - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Non WBC Interference - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Nucleated Red Blood Cells - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Nucleated Red Blood Cells - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

$ > NULL - Delta Check Alarm Not Defined

The Delta Check mechanism is defined in the parameter file but not in the Alarm Dictionary.

Corrective Action

Define the Delta Check alarm in the Alarm Dictionary.

NULL - Delta Check Alarm Not Selected

The Delta Check mechanism is not defined in the parameter file.

Corrective Action

Call Siemens Service for assistance in modifying the parameter file.

NULL - Number Max of Rerun Not Defined

The number of authorized reruns is not defined in the parameter file.

Corrective Action

Using the Customer Parameters window, define the parameter, Max Number of Automatically Proposed Reruns, to specify the maximum number of reruns proposed by the Data Manager.

NULL - Status Modified

The status of the specified sample has been modified.

Corrective Action

No operator action required.

O

Open Port Error

A software preparation (initialization) error has occurred.

Corrective Action

1. Select **Shut Down ADVIA** at the Log On/Off window.
2. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.
3. If the error recurs, select **Customize** menu, **System Setup**, **Tools Modify**, **Port Configuration**.
4. Verify that the Inst1 device is listed as ADVIA 2120/2120i and correct it if necessary.
5. Check the communications port where the problem occurs (COM 1 or MCA Serial board).

If the system is using the Host Spec 79 Network connection, Siemens Field Service personnel should make sure the Host name and IP address are specified correctly:

1. Use Windows Explorer to open the directory **C:\WINNT\system32\drivers\etc**.
2. Double-select **Hosts**.
3. In the Open with box, select **Notepad** and select **OK**.
4. At the bottom of the document, verify the host IP address and the host computer name match those supplied by the host computer administrator**.** Make sure the address and name are separated by at least one space.
5. If there is an error in the Host name or IP address, correct it. Then on the File menu, select **Save**.
6. Close Notepad.

OPEN - Sid# Already Exists

The host has sent a workorder to the Data Manager that already exists in the database. The Data Manager cannot update the current workorder with the new one because the sample status is Incomplete, Current Complete, Complete, or All Complete.

Parallel Node Error - Reset Required

Potential software communication error or hardware failure associated with the Parallel Node Board.

Possible Cause	Corrective Action
1 Software communication error or hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** in the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 Faulty power supply, fuse, cable, Parallel Node Board, or Can Bus Scrambler Board	Call Siemens Service for assistance.

Patient QC Formula Not Defined

This error occurs when there is no value defined for the FSE parameter Calculs_PatientQC_Formula. This parameter determines the formula used to calculate the moving average. To define the parameter, contact your local Siemens technical support provider.

The possible settings for the parameter are:

0 = parameter not active

1 = Bull’s Algorithm

2 = arithmetic mean

Patient QC Formula Not Defined – Parameterization – Calcul

This error occurs when there is no value defined for the FSE parameter Calculs_PatientQC_Formula. This parameter determines the formula used to calculate the moving average. To define the parameter, contact your Siemens Field Service Representative.

The possible settings for the parameter are:

0 = parameter not active

1 = Bull’s Algorithm

2 = arithmetic mean

Patient Result Database Is Full

The patient result database has reached maximum capacity, causing the autosampler to stop and transition the system state to "Aspiration Paused."

Corrective Action

Increase available patient result database space by deleting data from the sample results file. Use Customize, System Setup, Tools Modify, End of Day.

IMPORTANT
Deleting files permanently erases data. If you need an electronic copy of the data, back up the files before deleting.

Patient Result Database Is Nearly Full

The patient result database has reached the level specified as the warning level, causing the autosampler to stop and transition the system state to "Ready to Run."

Corrective Action

Increase available patient result database space by deleting data from the sample results file. Use Customize, System Setup, Tools Modify, End of Day.

IMPORTANT
Deleting files permanently erases data. If you need an electronic copy of the data, back up the files before deleting.

Pattern File (Win.cus) Does Not Exist

The file containing the customer parameters does not exist. A substitute file using default values has been created.

Corrective Action

Call Siemens Service for assistance.

PEROX 1 Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

PEROX 1 Reagent Expired

Present date is beyond the PEROX 1 reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

PEROX 1 Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

PEROX 2 Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

PEROX 2 Reagent Expired

Present date is beyond the PEROX 2 reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

PEROX 2 Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

PEROX 3 Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

PEROX 3 Reagent Expired

Present date is beyond the PEROX 3 reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

PEROX 3 Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

PEROX Irregular Flow Rate - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

PEROX Irregular Flow Rate - Stop

The number of cycles specified for a stop message. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

PEROX Power Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

PEROX Power Low - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

PEROX Sample Pump Error - Reset Required

PEROX sample syringe pump not in home position, failed to respond, or a transmission error occurred.

Possible Cause	Corrective Action
1 PEROX sample syringe pump not moving or not in home position.	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 PEROX sample syringe incorrectly assembled.	Follow the steps in Replacing the Syringe Plungers.
3 Faulty power supply, fuse, cable, pump assembly, Can Bus Scrambler Board, or Dual Servo Pump Control Board.	Call Siemens Service for assistance.

PEROX Saturation - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

PEROX Saturation - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

PEROX SHEATH Pump Error - Reset Required

PEROX SHEATH syringe pump not in home position, failed to respond, or a transmission error occurred.

Possible Cause	Corrective Action
1 PEROX SHEATH syringe pump not moving or not in home position.	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 PEROX SHEATH syringe incorrectly assembled.	Follow the steps in Replacing the Syringe Plungers.
3 Faulty power supply, fuse, cable, pump assembly, Can Bus Scrambler Board, or Dual Servo Pump Control Board.	Call Siemens Service for assistance.

PEROX SHEATH Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

PEROX SHEATH Reagent Expired

Present date is beyond the PEROX 3 SHEATH reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

PEROX SHEATH Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

PEROX Temperature Out - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

PEROX Temperature Out - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Platelet Clumps - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Platelet Clumps - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Platelet Noise - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Platelet Noise - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Possible Blasts or Abnormal Cells - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Possible Blasts or Abnormal Cells - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Power Pack Temperature High

The internal temperature of the power supply has exceeded the maximum limit.

Possible Cause	Corrective Action
1 Fan filters are dirty	Shut down the system and remove and clean the air-circulation filter as directed in the Operator's Guide.
2 System internal temperature exceeds the maximum limit	**a** Shut down the system. **b** Allow the system to cool down for 15 minutes. **c** Restart the system. **d** If the problem persists, call Siemens Service for assistance.
3 Fans are not functioning properly	Verify fan operation. If you suspect that a fan is not working properly, call Siemens Service for assistance.
4 Faulty power pack temperature sensor	Call Siemens Service for assistance.

Pressure Node Error - Reset Required

Potential software communication error or a hardware failure associated with the Pressure Node Board.

Possible Cause	Corrective Action
1 Hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 Pressure out of range.	Verify pressure readings and adjust if necessary.

3	Faulty power supply, fuse, cable, Pressure/Switch Node Board, or Can Bus Scrambler Board.	Call Siemens Service for assistance.

Printer Busy - Printing Aborted

The printer was busy when a printout was requested.

Corrective Action

Restart the printout when the printer is free.

Printer Not Defined

The printer is not defined in the Port Configuration window.

Corrective Action

Correct or enter the printer definition in the Port Configuration window. Select Customize menu, System Setup, Tools Modify, Port Configuration.

Printer Not Ready - Impression Aborted

A printer problem has occurred during background printing of a results report. No message box is displayed. The printout will resume as soon as the printer is available.

Corrective Action

Verify printer connections and operation.

Printer Problem - Alarm

A printer problem has occurred. The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

Corrective Action

Verify printer connections and operation. Typical printer problems include:

- Paper jams
- Out of paper
- Printer offline
- Printer disconnected

Printer Problem - Stop

A printer problem has occurred. The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Corrective Action

Verify printer connections and operation. Typical printer problems include:

- Paper jams
- Out of paper
- Printer offline
- Printer disconnected

Probe Clog

Conductivity detector did not detect a sample within twenty seconds of aspiration.

	Possible Cause	Corrective Action
1	Clogged sample	Check for sample clots.
2	Insufficient sample volume	Sample tube may have been removed before aspiration was complete. Re-aspirate sample. If error persists clean the sample shear valve.
3	Insufficient vacuum	Check vacuum gauge and adjust if necessary.
4	Clogged clot filter	Remove clot filter and discard as biohazardous material. Replace clot filter**.**
5	Loose connection in sample line	Check connections and tighten if necessary**.**
6	Clogged needle	Rinse needle. Select **Utilities** menu, **Hydraulic Functions** tab, **Needle Rinse.**

7	Bent or damaged needle	Replace the needle. Follow the steps in Replacing the Sampler Needles
8	Faulty Conductivity Detector	Contact your local Siemens technical support provider for assistance.

Q

QC Sample Deleted Before Validation

A control sample that was not validated has been deleted.

Daily QC may not be consistent.

R

Rack or Position Barcode Not Read - Alarm

The barcode reader cannot determine a valid rack ID or position number for the current tube position. The number of consecutive occurrences of this condition has met the criterion specified for an alarm message in the Alarm/Stop Criteria window.

Possible Cause		Corrective Action
1	Barcode label improperly placed, obscured, or absent.	Check that a barcode label is properly attached and meets specifications. Replace if necessary.
2	Faulty barcode reader.	Call Siemens Service for assistance.

Rack or Position Barcode Not Read - Stop

The barcode reader cannot determine a valid rack ID or position number for the current tube position. The number of consecutive occurrences of this condition has met the criterion specified for a stop message in the Alarm/Stop Criteria window, and the autosampler has halted.

Possible Cause		Corrective Action
1	Barcode label improperly placed, obscured, or absent.	Check that a barcode label is properly attached and meets specifications. Replace if necessary.

2	Faulty barcode reader.	Call Siemens Service for assistance.

RBC Fragments - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RBC Fragments - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RBC Ghosts - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RBC Ghosts - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RBC Irregular Flow Rate - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RBC Irregular Flow Rate - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RBC Reagent Empty - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The reagent is empty, and the autosampler has halted. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The stop counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation. Select Start/Stop to continue the run.

RBC Reagent Expired

Present date is beyond the RBC reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

RBC Reagent Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message, indicating that the reagent level is low. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria, Reagent Conditions.

Corrective Action

The alarm counter is automatically reset after reagents are replenished and the Reagent Installation window is updated. Go to Logs, Reagent Log, Reagent Installation.

RBC Sample Pump Error - Reset Required

RBC sample syringe pump not in home position, failed to respond, or a transmission error occurred.

Possible Cause	Corrective Action
1 RBC sample syringe pump not moving or not in home position.	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 RBC sample syringe incorrectly assembled.	Follow the steps in Replacing the Syringe Plungers.
3 Faulty power supply, fuse, cable, pump assembly, Can Bus Scrambler Board, or Dual Servo Pump Control Board.	Call Siemens Service for assistance.

RBC Sheath Pump Error - Reset Required

RBC Sheath syringe pump not in home position, failed to respond, or a transmission error occurred.

Possible Cause	Corrective Action
1 RBC Sheath syringe pump not moving or not in home position.	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart.

		i Select **Shut Down ADVIA** at the Log On/Off window. ii Select **Off** at the analyzer touchpad. iii Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. iv Restart the analyzer by selecting **On** at the analyzer touchpad.
2	RBC Sheath syringe incorrectly assembled.	Follow the steps in Replacing the Syringe Plungers.
3	Faulty power supply, fuse, cable, pump assembly, Can Bus Scrambler Board or Dual Servo Pump Control Board.	Call Siemens Service for assistance.

Ready to Run

The system is ready to accept the aspiration of a sample or the start of a hydraulic cycle. The green ready-to-aspirate light is lit.

Results Received for Tube Not in

Pending File Sid#: xxx Seq#: A set of results has been received for a sample that is not in the Pending file. The set of results has been refused and deleted.

Corrective Action

Check pending list before run.

RETIC Absorption Distribution Abnormal - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC Absorption Distribution Abnormal - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC Fit Suspect - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC Fit Suspect - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC Irregular Flow Rate - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC Irregular Flow Rate - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC Noise Origin - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC Noise Origin - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC - PLT Interference/Error - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC - PLT Interference/Error - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC RBC Count Low - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC RBC Count Low - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC Saturation Cells - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC Saturation Cells - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

RETIC Slope Error - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

RETIC Slope Error - Stop

The number of consecutive occurrences of this condition has met the criterion specified for a stop message. The autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Review Mode Change to Review None

The validation mode has been modified through the Parameters menu in the Review and Edit window.

Running

Displayed after pressing the autosampler Start/Stop button or during sample processing.

Possible Cause	Corrective Action
If the system halts in the **Running** state, there could be a hardware or software failure.	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window.

ii Select **Off** at the analyzer touchpad.

iii Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

iv Restart the analyzer by selecting **On** at the analyzer touchpad.

S

$ > Sample ID Not Read - Alarm

Sample-tube barcode label is unreadable or missing. The number of consecutive occurrences of this condition has met the criterion specified for an alarm message.

Possible Cause	Corrective Action
1 Barcode label improperly placed, obscured, or not present.	Verify that a barcode is present and correctly applied to the sample tube (with the label flush against the rim of the stopper). Verify that the barcode is clean and of specified quality.
2 Barcode reader faulty.	Call Siemens Service for assistance.

Sample ID Not Read - Stop

Sample-tube barcode label is unreadable or missing. The number of consecutive occurrences of this condition has met the criterion specified for a stop message, and the autosampler has halted.

Possible Cause	Corrective Action
1 Barcode label improperly placed, obscured, or not present.	Verify that a barcode is present and correctly applied to the sample tube (with the label flush against the rim of the stopper). Verify that the barcode is clean and of specified quality.
2 Barcode reader faulty.	Call Siemens Service for assistance.

Sample Rejected: SID

The results for the last aspiration of this sample have been rejected. This sample record is full. A sample record can hold only 110 results, including C.Res. Prev.Run, and Prev.Res.

Corrective Action

Create a new workorder with the same patient demographics and assign a new SID #. Label the sample tube again with the new SID #, and run.

Sample Result Data Communication Failure

The Align Optics or Direct Optics cycle was exited before result processing was complete.

Corrective Action

Results produced when this error was triggered are invalid. Repeat sample aspiration for the affected samples.

Sample SID Not Found - Printing Aborted

The sample displayed in the Review and Edit window does not exist in the database. The system cannot provide the requested printout.

Corrective Action

Correct the problem using the Key list in the Format window.

Sample Status: – THE STATUS – Sid#:x R&P#:y

A sample with this status could not receive results. The results received for this sample have been refused.

Corrective Action

In the Customer Parameters window, modify the parameter that specifies each sample status allowed to receive results.

Sample xxx Is Not Transmitted to the Host

There is a transmission problem to the host computer. The message specifies the Sid# of the nontransmitted samples. Another message will follow identifying the specific problem.

Scan Denied - Reset Autosampler

Barcode reader is unable to scan.

Possible Cause	Corrective Action
1 Faulty barcode reader cabling	**a** At the analyzer touchpad, select **Off**. **b** Wait about 1 minute and select **On** to restart the analyzer.

		c If the problem persists, call Siemens Service for assistance.
2	Faulty barcode reader	See **1a**, **b**, **c**

SD Not Defined For Test# xx Control# xxyyzzz

No standard deviation is defined for this test and for this control in the Control Dictionary.

Corrective Action

Define the SD in the Control Dictionary.

Selected Printer Not Available - Result Report for SID#:

The printer is not responding to a print request.

Corrective Action

Check that the printer is powered on and has paper. Refer to the Message Log for details.

Selector Valve Error

Potential software communication error or a hardware failure associated with the selector-valve assembly.

Possible Cause		Corrective Action
1	Hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.

2	Faulty power supply, fuse, cable, selector valve assembly, UFC Scrambler Board, or Can Bus Scrambler Board	Call Siemens Service for assistance.

Selector Valve Timeout

The selector valve failed to return to the home position within the expected time interval.

Possible Cause	Corrective Action
1 Hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2 Faulty power supply, fuse, cable, selector valve assembly, UFC Scrambler Board, or Can Bus Scrambler Board.	Call Siemens Service for assistance.

SHEATH / RINSE Reagent Container Empty

SHEATH/RINSE level has dropped below the level sensor in the SHEATH/RINSE container, indicating that the container is empty. When this error message is displayed, the aspirate plate will not function, nor will the Ready light illuminate.

Possible Cause	Corrective Action

1	SHEATH/RINSE is empty.	Replace SHEATH/RINSE reagent and use the message icon to Remove the error message.
2	Faulty level sensor.	Call Siemens Service for assistance.

SHEATH / RINSE Reagent Expired

Present date is beyond the SHEATH/RINSE reagent expiration date, as determined by encoded reagent container barcode label or as calculated from installation date and open container stability.

Corrective Action

Replenish expired reagents and update the Reagent Installation window. Go to Logs, Reagent Log, Reagent Installation.

Sid# Already Exists - Result Message Rejected

You have created a workorder with an Sid# having the format: 999XXXX. This format is used by the analyzer to send results of misread samples. The results are refused.

Corrective Action

Create a workorder with a proper Sid# format.

Standby

The analyzer is in a low-power state that reduces component wear during periods of inactivity. The green ready-to-aspirate light is off. Typically, the analyzer enters standby automatically. Use the touchpad Standby button to exit or enter the standby state manually.

Corrective Action

If the analyzer is locked in the standby state, verify that the pressure and vacuum readings are within range and adjust if necessary. Select Standby to exit.

Status BTRIEVE - Alarm Not Defined

An alarm sent from the analyzer is unknown to the Data Manager (not defined in the Alarm Dictionary).

Corrective Action

See Alarm Dictionary.

Status BTRIEVE - Test Not Found

A test defined in the Control Dictionary has been erased from the Test Dictionary.

Corrective Action

Enter test information in the Test Dictionary.

Syntax Error in AlarmExc.par

The parameter file, AlarmExc.par, is not correctly defined, or there is a blank line in the file. No exclusive analytical alarm will be taken into account in the patient QC calculation.

Corrective Action

Call Siemens Service for assistance.

System Preparation Failed

An error occurred during the initial system preparation phase.

Possible Cause	Corrective Action
1 Software communication failure	Follow these steps to exit the ADVIA 2120/2120i software and then restart. **a** Select **Shut Down ADVIA** in the Log On/Off window. **b** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.
2 Hardware error	Refer to associated hardware error message for appropriate corrective action.
3 Faulty CPU board	Call Siemens Service for assistance.

System Preparation in Progress

When the ADVIA 2120/2120i is first powered on or the software is restarted, the analyzer and the computer go through a preparation process which includes the following:

- Software initialization
- Internal diagnostic checks
- Priming of reagent lines
- Startup, including a background verification cycle

System Preparation Not Complete

Corrective Action

a. Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**.

b. After about 1 minute, if the status line does not display **Ready to Run** and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart.

 i. Select **Shut Down ADVIA** at the Log On/Off window.

 ii. Select **Off** at the analyzer touchpad.

 iii. Select **CTRL+ALT+DELETE** and log back onto the system to restart the software.

 iv. Restart the analyzer by selecting **On** at the analyzer touchpad.

T

Test Not Buffered - cTestCode

There are more than 60 tests ACTIVE in the Test Dictionary. No additional tests can be stored in memory.

Corrective Action

Cancel the selection of the active test that exceeded this limit in the Test Dictionary. Select Customize menu, System Setup, Tools Modify, Test Dictionary.

Tube xxx Not Transmitted to the Host

An expected result was not transmitted.

Corrective Action

Check the sample status and the contents of the file before attempting to retransmit this sample. The problem may be an acknowledgement problem at the host level. The communication line should be checked by Siemens Service personnel.

Type Not Found

The type of workorder sent by the host is unknown to the Data Manager. No type can be associated with the test request.

Corrective Action

Create this type in the Type Table Dictionary. Select Customize menu, System Setup, Tools Modify, Type Table Dictionary.

Types Table Test Doesn't Exist

A test defined in the Types Table has been deleted in the Test Dictionary.

Corrective Action

As appropriate, delete the test from the Type Table, or reenter the test in the Test Dictionary.

U

UFC Vacuum Out of Range

UFC Vacuum is out of range. The difference between the compressor vacuum and UFC vacuum is greater than 5" Hg.

Possible Cause	Corrective Action
1 Vacuum Setting is out of range	Check the system vacuum gauge and adjust the regulator if necessary. Setpoint: 20"Hg ± 1
2 Vacuum leak	**a** Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary. **b** Check the waste container to make sure that the spigot is closed and the cap is on securely.
3 Vacuum pump filter (vacushield) is clogged	Replace the vacuum pump filter.
4 Crimped waste line	Check for a crimped waste line on the waste container. Straighten or reconnect lines as necessary.

UFC Vacuum Out of Range - Stop

System vacuum is out of range. The system has stopped because the vacuum has reached a critical level that may affect the integrity of sample results and damage the system. The difference between the compressor vacuum and UFC vacuum is greater than 5" Hg.

Possible Cause	Corrective Action
1 Vacuum Setting is out of range	Check the system vacuum gauge and adjust the regulator if necessary. Setpoint: 20"Hg ± 1

2	Vacuum leak	**a** Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary. **b** Check the waste container to make sure that the spigot is closed and the cap is on securely.
3	Vacuum pump filter (vacushield) is clogged	Replace the vacuum pump filter.
4	Crimped waste line	Check for a crimped waste line on the waste container. Straighten or reconnect lines as necessary.

IMPORTANT
If problems persist, Call Siemens Service for assistance. Further corrective action must be taken by Siemens service personnel only.

Unable to Process Results - Check Instrument Parameterization

The image result does not match the numeric result.

Corrective Action

Call Siemens Service for assistance.

Unable to Process Results - Communication Line Fault

A defect on the communication line has made the numeric results unreadable.

Corrective Action

Call Siemens Service for assistance.

Unable to Process Results - IDee Too Long

The IDee received from the analyzer is longer than 14 digits.

Corrective Action

Check the length of the sample ID.

Unknown Host Test Number xx

A workorder from the host contains a test that is not defined in the Test Dictionary or contains an incorrect host number.

Corrective Action

Modify the Test Dictionary or correct the host test table. Do not modify the Test Dictionary while samples remain in the database.

V

Vacuum Out of Range

System vacuum is out of range.

Possible Cause	Corrective Action
1 Vacuum gauge is out of range	Check the system vacuum gauge and adjust the regulator if necessary. Setpoint 20" Hg ± 1.
2 Vacuum leak	**a** Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary. **b** Check the waste container to make sure that the spigot is closed and the cap is on securely.

Vacuum Out of Range - Stop

System vacuum is out of range.

Possible Cause	Corrective Action
1 Vacuum gauge is out of range	Check the system vacuum gauge and adjust the regulator if necessary. Setpoint 20" Hg ± 1.
2 Vacuum leak	**a** Check for crimped or disconnected hydraulic or pneumatic lines. Straighten or reconnect lines as necessary. **b** Check the waste container to make sure that the spigot is closed and the cap is on securely.

Valve Node 1 Error - Reset Required

Potential software communication error or a hardware failure associated with the Valve Driver 1 Board.

Possible Cause	Corrective Action
1 Hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** at the Log On/Off

		window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by pressing **On** at the analyzer touchpad.
2	Faulty power supply, fuse, cable, Valve Driver 1 Board, or Can Bus Scrambler Board	Call Siemens Service for assistance.

Valve Node 2 Error - Reset Required

Potential software communication error or a hardware failure associated with the Valve Driver 2 Board.

Possible Cause		Corrective Action
1	Hardware failure	**a** Reset the analyzer by selecting **Utilities, Exerciser, Indicators, Analyzer Reset**. **b** After about 1 minute, if the status line does not display Ready to Run and the green ready-to-aspirate light is still off, follow these steps to exit the ADVIA 2120/2120i software, turn off the analyzer and then restart. **i** Select **Shut Down ADVIA** in the Log On/Off window. **ii** Select **Off** at the analyzer touchpad. **iii** Select **CTRL+ALT+DELETE** and log back onto the system to restart the software. **iv** Restart the analyzer by selecting **On** at the analyzer touchpad.
2	Faulty power supply, fuse, cable, Valve Driver 2 Board, or Can Bus Scrambler Board	Call Siemens Service for assistance.

W

Waste Container - Full

Waste level in the container has reached the level sensor indicating that the container is full. When this error message is displayed, the aspirate plate will not function, nor will the Ready light illuminate.

	Possible Cause	Corrective Action
1	The waste container is full.	Follow the steps in Emptying the Waste Container.
2	Level sensor cable is disconnected.	Verify connection is secure.
3	Faulty level sensor.	Call Siemens Service for assistance.

WBC Substitution - Alarm

The number of consecutive occurrences of this condition has met the criterion specified for an alarm message. The specified alarm criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Alarm Criteria is automatically reset.

WBC Substitution - Stop

The number of consecutive occurrences of this condition has

autosampler halts at the same time the stop message occurs. The specified stop criterion is user definable in the Customize Menu, System Setup, Alarm/Stop Criteria. The counter associated with the Stop Criteria is reset when the Start/Stop button is selected.

Wrong Sample Type for Test Number xx

The type defined in the Test Dictionary for this test is not consistent with the sample type in process.

Corrective Action

Check the Test Dictionary and the pending sample for the proper sample type.

Wrong Test Group Defined

A test has been defined in several test groups, or it has been defined in a test group but not in the Test Order Table. The Data Manager cannot manage the defined test groups.

Corrective Action

Use the Customer Parameters window to correct the test group definition.

X

Y

Z

Methods

BASOPHIL / LOBULARITY METHOD 3

CYTOCHEMICAL REACTIONS 3
BASOPHIL / LOBULARITY TEMPERATURE CONTROL 3
ADVIA 2120/2120I BASO REAGENT 3
ADVIA 2120/2120I SHEATH / RINSE 3
MEASUREMENT 4
BASO RATE HISTOGRAM 4
BASO X HISTOGRAM 5
BASO Y HISTOGRAM 5
BASO CYTOGRAM: CLUSTER ANALYSIS 6
BASO CYTOGRAM: HISTOGRAM ANALYSIS 7
ABNORMAL CELL LOCATIONS 9
CALCULATING PARAMETERS 11

CSF METHOD 16

CYTOCHEMICAL REACTIONS 16
MEASUREMENT 16
CSF SCATTER/SCATTER CYTOGRAM 16
CSF SCATTER/ABSORPTION CYTOGRAM 16
CALCULATING PARAMETERS 17

HEMOGLOBIN METHOD 21

CHEMICAL REACTIONS 21
ADVIA 2120/2120I HGB 21
BIBLIOGRAPHY 22
MEASUREMENT 22
CALCULATING PARAMETERS 23

PEROXIDASE METHOD 25

CYTOCHEMICAL REACTIONS 25
ADVIA 2120/2120I PEROX 1 25
ADVIA 2120/2120I PEROX 2 26
ADVIA 2120/2120I PEROX 3 26
ADVIA 2120/2120I PEROX SHEATH 26
MEASUREMENT 26
PEROX RATE HISTOGRAM 27
PEROX X HISTOGRAM 27
PEROX Y HISTOGRAM 28
NOISE–LYMPH HISTOGRAM 28
PEROX CYTOGRAM 28
ABNORMAL CELL LOCATIONS 30
CALCULATING PARAMETERS 32

RBC / PLATELET METHOD 37

CYTOCHEMICAL REACTIONS 37
ADVIA 2120/2120I RBC / PLT 38
MEASUREMENT 38
MEASUREMENT: RBC METHOD 38
MEASUREMENT: PLATELET METHOD 39
BIBLIOGRAPHY 39

RBC RATE HISTOGRAM 40
RBC VOLUME HISTOGRAM 40
RBC HC HISTOGRAM 42
RBC CH HISTOGRAM 43
RBC SCATTER CYTOGRAM 43
RBC VOLUME / HEMOGLOBIN (V / HC) CYTOGRAM 44
RBC MATRIX 45
PLATELET X HISTOGRAM 46
PLATELET Y HISTOGRAM 46
PLATELET VOL HISTOGRAM 46
PLATELET PC HISTOGRAM 47
PLT SCATTER CYTOGRAM 47
PLT VOLUME / PC CYTOGRAM 48
INTEGRATED ANALYSIS 48
CALCULATING RBC PARAMETERS 49
CALCULATING PLATELET PARAMETERS 53
NRBC ANALYSIS 56

RETICULOCYTE METHOD 58

CYTOCHEMICAL REACTIONS 58
ADVIA 2120/2120I AUTORETIC 58
MEASUREMENT 58
RETICULOCYTE METHOD NOMENCLATURE 59
RETIC RATE HISTOGRAM 59
RETIC ABS FLATNESS HISTOGRAM 60
RETIC ABS HISTOGRAM 60
RETIC VOLUME HISTOGRAM 60
RETIC HC HISTOGRAM 61
RETIC CH HISTOGRAM 63
RETIC SCATTER ABS CYTOGRAM 64
RETIC V / HC CYTOGRAM 65
RETIC SCATTER CYTOGRAM 65
BIBLIOGRAPHY 66
CALCULATING RETIC PARAMETERS 66

Basophil / Lobularity Method

Cytochemical Reactions

The basophil/lobularity cytochemical reactions consist of two steps:

Step 1 Red blood cells and platelets are lysed using the ADVIA 2120/2120i BASO reagent.

Step 2 All white blood cells *except* basophils are stripped of their cytoplasm using the
ADVIA 2120/2120i BASO reagent and the increased temperature in the reaction chamber.

The stripped white cells can now be categorized as mononuclear or polymorphonuclear cells based on the shape and complexity of their cell nuclei. The intact basophils can be easily distinguished from the smaller cell nuclei.

Basophil / Lobularity Temperature Control

Temperature control is critical to the cell-stripping process. The baso reaction chamber temperature, which is automatically monitored by the analyzer, must be between 32 °C and 34 °C.

If you want to check the baso reaction chamber temperature:

At the Utilities menu, select **Analyzer Status**.

If you need to adjust the baso reaction chamber temperature:

1. At the Special Procedures menu, select **Adjust Lamp / Temp**.
2. Select **Baso Temperature**.

ADVIA 2120/2120i BASO Reagent

NOTE: For more detailed information on the contents of ADVIA 2120/2120i BASO reagent, please see Chapter 8.

The ADVIA 2120/2120i BASO reagent contains phthalic acid and a surfactant that lyses the red cells, platelets, and the cytoplasm of all white cell types except basophils.

ADVIA 2120/2120i SHEATH / RINSE

NOTE: For more detailed information on the contents of ADVIA 2120/2120i SHEATH/RINSE, please see Chapter 8

ADVIA 2120/2120i SHEATH/RINSE has several important functions:

Optical sheath for Baso, RBC / Platelet, and Reticulocyte Methods

- Constricts the sample stream so that only one cell at a time can pass through the viewing area

- Prevents contact between the sample stream and the flowcell walls, which prevents clogs and staining of the flowcell
- Provides an optically transparent medium through which the sample stream can be clearly focused

Rinse for Baso, RBC / Platelet, Peroxidase, Reticulocyte, and Hemoglobin Methods

- Cleans the hydraulic pathways for each method

Baseline solution for Hemoglobin Method

- Provides a baseline reading

Measurement

A constant volume of the cell suspension from the baso reaction chamber passes through the flowcell where the low-angle light scatter (2° – 3°) and high-angle light scatter (5° – 15°) signatures of each white blood cell are measured, based on:

- The size of the cell or nucleus
- The nuclear configuration, which is a combination of the nuclear shape and cell density

ADVIA 2120/2120i SHEATH/RINSE encases the sample stream as the two fluids pass through the flowcell.

The optical signals from the flowcell are converted to electrical pulses by photodiodes. After processing, the following information is available:

BASO Rate histogram displays the arrival rate of cells in the Baso channel.

BASO X histogram displays the high-angle light scatter information (nuclear configuration) for the MN (mononuclear) and PMN (polymorphonuclear) populations.

BASO Y histogram displays the low-angle light scatter information (size) for the MN population.

BASO cytogram is formed from the paired low and high-angle light scatter data. Cluster analysis identifies the individual populations.

If cluster analysis cannot be used for a particular sample, the cell populations are identified using histogram analysis.

BASO Rate Histogram



The BASO Rate histogram shows the uniformity of the cell-counting rate.

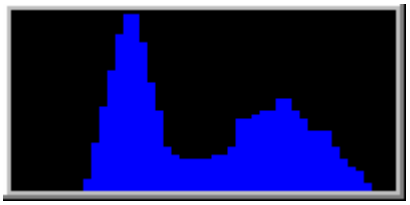
The rate histogram data consists of 50 points, one taken every 200 milliseconds. Each point represents the number of valid cells counted during the last 200 milliseconds.

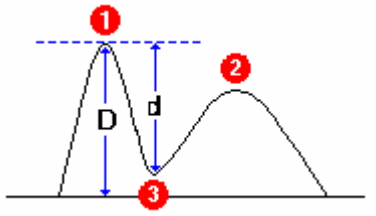
BASO X Histogram

The BASO X histogram displays the event distributions that correspond to the entire x axis of the BASO cytogram. However, it contains only those events on the y axis between the noise and basophil thresholds of the BASO cytogram. This will include the MN (mononuclear) and PMN (polymorphonuclear) populations.

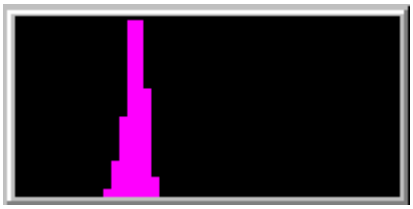
The following parameters are derived from the BASO X histogram:

- The mode channel (MNx) of the MN population on the x axis (1) (The mode channel contains the largest number of cells in a particular population.)
- The mode channel (PMNx) of the PMN population on the x axis (2)
- The valley channel that separates the MN/PMN populations (3) (The valley channel contains the fewest number of cells between two populations.)
- The relative depth of the valley as expressed by d/D (BASO d/D)
- The Lobularity Index (LI) value provides an indication of sample abnormality. The Ll is the PMN peak channel number on the Baso X histogram divided by 14, and it is greater than 1.9 for normal samples. Values lower than 1.9 are usually indicative of sample abnormality.





BASO Y Histogram



The BASO Y histogram displays the event distributions from the noise threshold to channel 49 on the y axis of the BASO cytogram. However, it contains only those events on the x axis up to the MN/PMN valley channel of the BASO cytogram. This will include the MN (mononuclear) population.

The BASO Y histogram is used to determine the mode channel (MNy) of the MN population on the y axis.

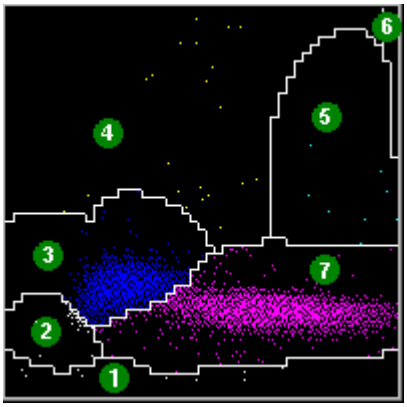
BASO Cytogram: Cluster Analysis

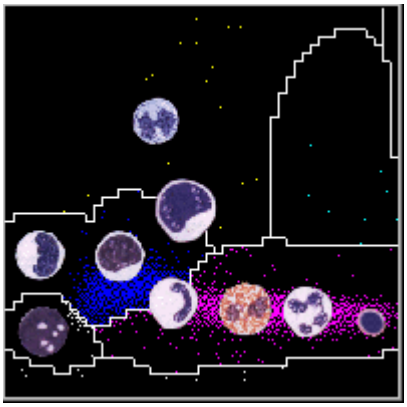
The BASO cytogram is divided into 50 counting channels on each axis.

When the high-angle light scatter (nuclear configuration) is plotted on the x axis, and the low-angle light scatter (cell size) is plotted on the y axis, distinct populations or clusters are formed.

Cluster analysis identifies each population based on its position, area, and density, and then counts the number of cells/nuclei in each population.

The following BASO cytograms were obtained from a representative patient specimen.





1 Noise
2 Blast cell nuclei
3 Mononuclear WBCs (Monocyte and Lymphocyte nuclei)
4 Basophils
5 Baso Suspect
6 Saturation
7 Polymorphonuclear WBCs (Neutrophil and Eosinophil nuclei)

Noise Area

This area contains platelets, RBC stroma, and other cellular debris that are not included in the total white blood cell count (WBCB).

Blast Cluster

When present, blasts appear in the blast cluster.

Mononuclear Cluster

In normal samples, the MN population contains lymphocyte and monocyte nuclei.

Basophil Cluster

With their cytoplasm intact, basophils are much larger than the white cell nuclei and appear in the Basophil cluster.

Baso Suspect Cluster

Contains unlysed cells other than basophils. Counts from this area are not included in the basophil count.

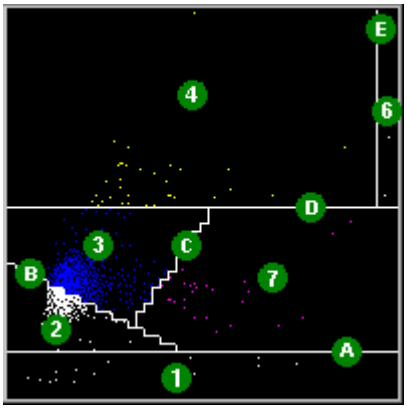
Saturation Area

Typically, this area contains air bubbles that are not included in the basophil or WBCB count.

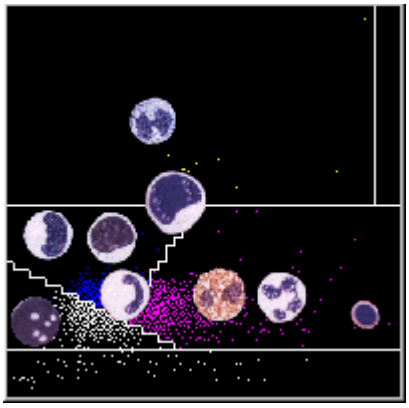
Polymorphonuclear Cluster
In normal samples, the PMN population contains eosinophil and neutrophil nuclei.

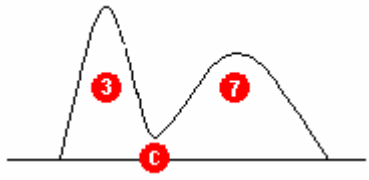
BASO Cytogram: Histogram Analysis

If the cluster analysis does not agree with a normal archetype due to a low cell count, or if there is only one identifiable cell population, the following cell populations are identified using histogram analysis: Basophils, MN (mononuclear cells), PMN (polymorphonuclear cells), Blasts, Noise, and Baso Saturation area.



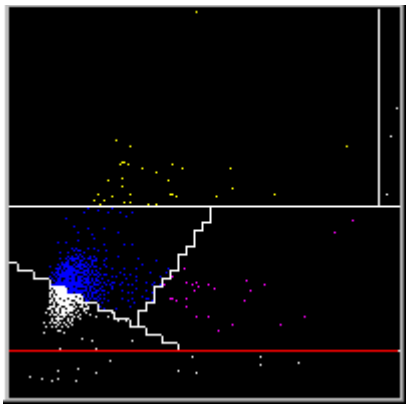
A Baso Noise threshold
B Blast threshold
C MN/PMN valley threshold
D Basophil threshold
E Baso Saturation threshold
1 Noise nuclei
2 Blast cell
3 Mononuclear WBCs (Monocyte and Lymphocyte nuclei)
4 Basophils
5 not used
6 Saturation
7 Polymorphonuclear WBCs (Neutrophil and Eosinophil nuclei)





BASO X histogram

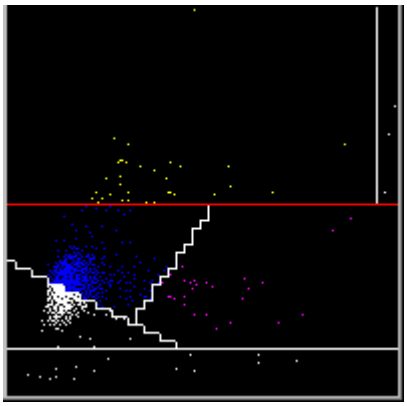
Baso Noise Threshold



This threshold (shown as a red line) is set at channel 4 on the y axis.

Events below this threshold are counted as noise, while cells above the threshold are included in the white cell count (WBCB).

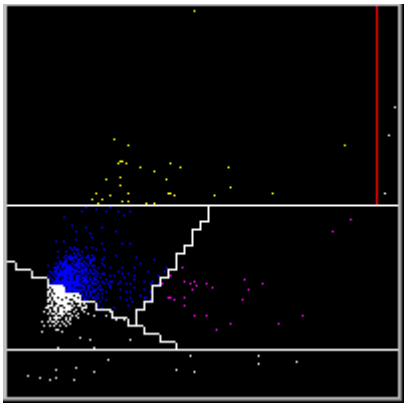
Basophil Threshold



This threshold (shown as a red line) separates the Basophils from the nuclei of the other cell types.

The threshold is set at channel 21 on the y axis. All cells above this threshold are counted as Basophils.

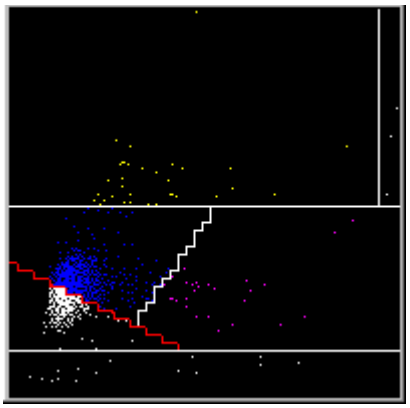
Baso Saturation Threshold



This threshold (shown as a red line) is set at channel 45 on the x axis and channel 21 on the y axis.

Events within this area (microbubbles, clumped cells, and unlysed cells) are monitored for flagging purposes.

Blast Threshold

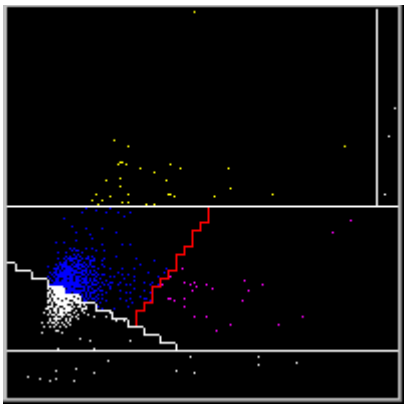


This threshold (shown as a red line) is set at channel 8 on the x axis and between channels 4 and 21 on the y axis.

All cells below (to the left of) this threshold are counted as Blasts, which are monitored for flagging purposes only.

The Blast count should not be reported as a patient result.

MN / PMN Threshold



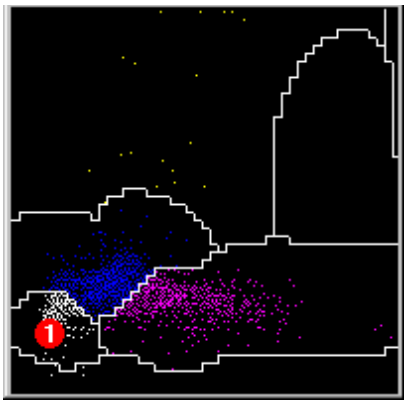
The "valley" threshold (shown as a red line) separates the Mononuclear (MN) and Polymorphonuclear (PMN) populations.

The valley threshold is a floating threshold that is set using the Baso X histogram.

Abnormal Cell Locations

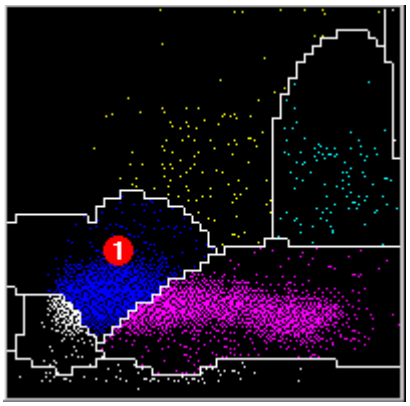
If abnormal cells are present, their size and nuclear configuration determine the location of their signals on the BASO cytogram. Click the cytogram buttons below to see where the abnormal cells will appear.

Location of Blasts on the BASO Cytogram



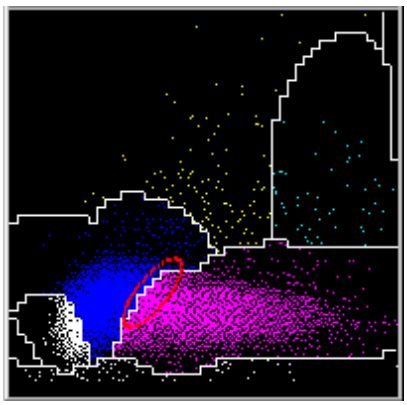
Blasts appear in the Blast area (1) on the BASO cytogram.

Location of Atypical Lymphocytes on the BASO Cytogram



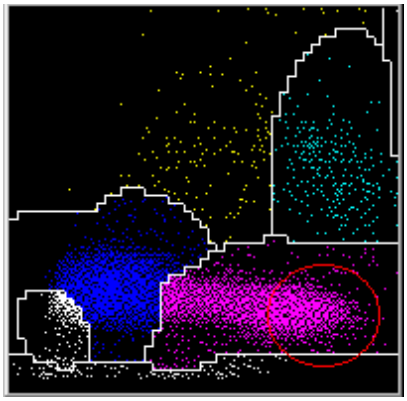
Atypical Lymphocytes appear within the mononuclear (MN) area (1) on the BASO cytogram.

Location of Immature Granulocytes on the BASO Cytogram



Immature Granulocytes appear within the MN area on the BASO cytogram.

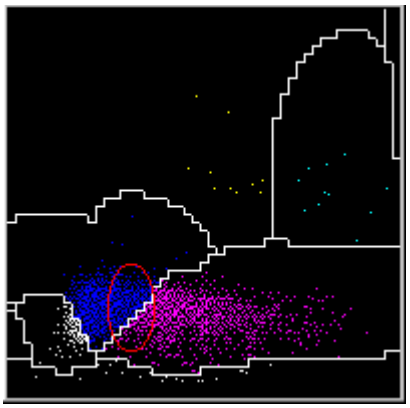
Location of NRBCs on the BASO Cytogram



Nucleated Red Blood Cells (NRBCs) appear within the PMN population on the BASO cytogram. However, NRBCs are identified for flagging purposes in the peroxidase method.

The system uses data from the perox channel and the baso channel to derive the Nucleated Red Blood Cell (NRBC) count (%NRBC and #NRBC). If NRBCs are present, the system corrects the WBC results to account for them.

Location of Bands on the BASO Cytogram



Bands appear between the mononuclear (MN) and polymorphonuclear (PMN) populations.

Calculating Parameters

Reported Parameters

The following parameters are available for patient reporting:

Parameter	Explanation
WBCB	RawWBC x (BasoCalFactor ÷ [1-FracDT])
%BASO	100 x (BASO Count ÷ BASO PHA Cells)
#BASO	(%BASO ÷ 100) x WBCB

The system uses data from the perox channel and the baso channel to derive the Nucleated Red Blood Cell (NRBC) count (%NRBC and #NRBC). If NRBCs are present, the system corrects the WBC results to account for them.

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
%BASO Suspect	100 x (BASO Suspect ÷ BASO PHA Cells)
%BLAST	100 x (Blasts ÷ BASO PHA Cells)
%MN	100 x (MN ÷ BASO PHA Cells)
%PMN	100 x (PMN ÷ BASO PHA Cells)
%PMN Ratio	%PMN ÷ (%NEUTS + %EOS)
BASO % Dead Time	100 x FracDT
BASO % Noise	100 x (Noise ÷ BASO PHA Cells)

Parameter	Explanation
BASO % Saturation	100 x (BASO Saturation ÷ BASO PHA Cells)
BASO Flatness	$\sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$
LI	PMNx ÷ MNx
MNx	Peak X channel of Mononuclear cluster
MNy	Peak Y channel of Mononuclear cluster
PMNx	Peak X channel of Polymorphonuclear cluster

Parameter Key

WBCB
White blood cell count from theBasophil/Lobularity method

BASO
Absolute count of Basophils

% BASO
Percent of Basophils

% BASO Suspect
Percent of events from Baso Suspect area

% MN
Percent of events from Mononuclear area

% PMN
Percent of events from Polymorphonuclear area

% PMN Ratio
Ratio of the percent of the Polymorphonuclear events to the percent of NEUTS and EOS obtainedfrom the peroxidase method

BASO % Dead Time
Percent of analysis time when the channel is busy and cannot detect flowcell events

BASO % Noise
Percent of events from Noise area

BASO % Saturation
Percent of events from Saturation area

LI
Lobularity Index

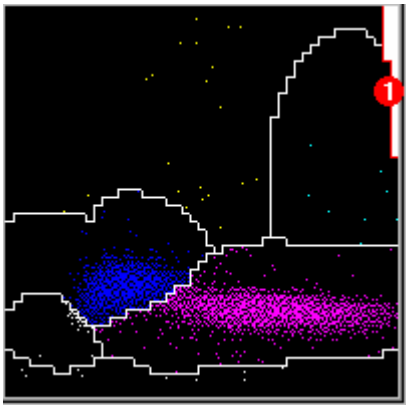
% Blast
Percent of events from Blast area

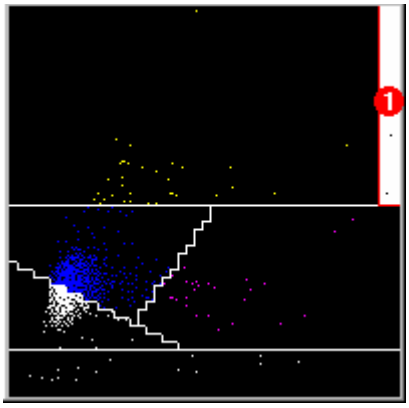
BASO PHA Cells (B-acq)
The total number of events in the BASO cytogram excluding the Noise area.

BASO PHA Total (B-tot)
The total number of events in the BASO Cytogram including the Noise area.

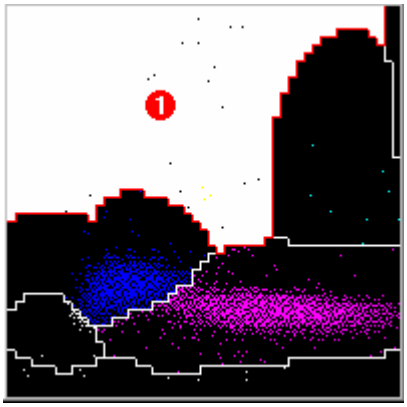
BASO Valid Cells (B-vc)
The number of valid electronic pulse signals detected from flowcell events.

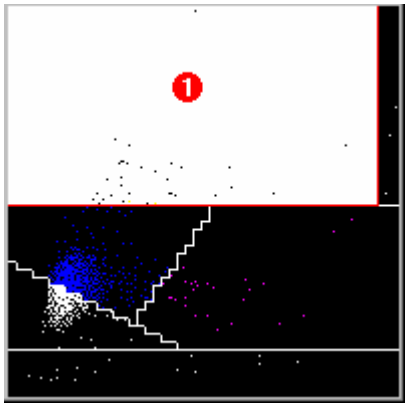
BASO Saturation
The number of events in the Saturation area (1) of the BASO cytogram.





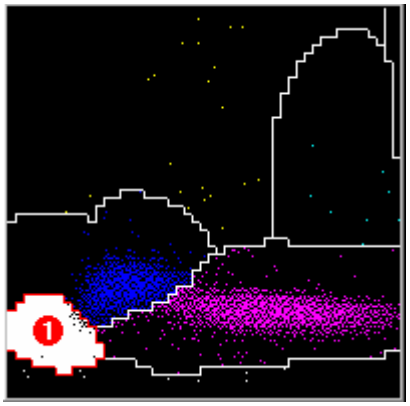
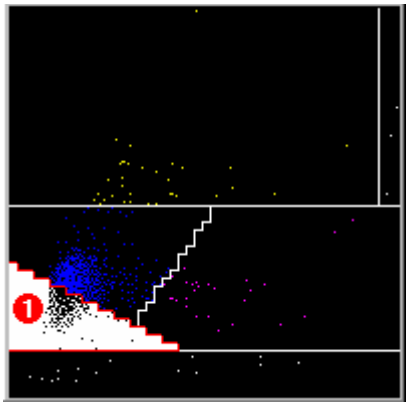
BASO Count
The number of cells in the Baso area (1) of the BASO cytogram.





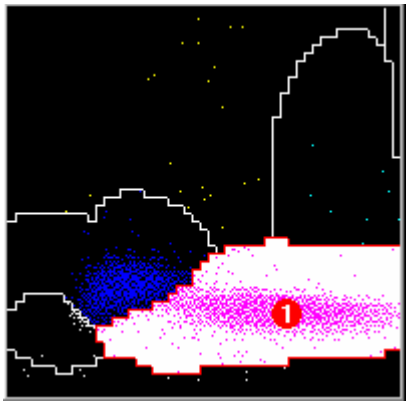
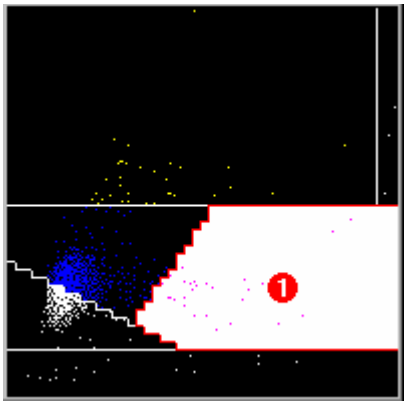
Blasts

The number of events in the Blasts area (1) of the BASO cytogram.

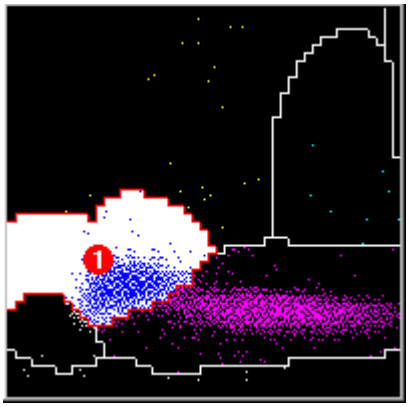
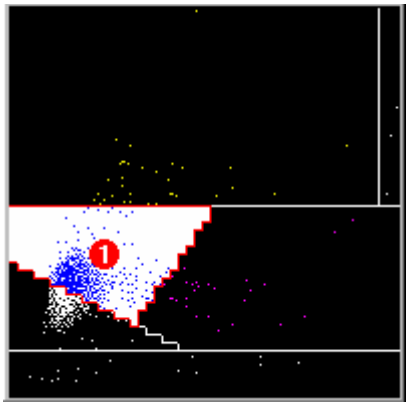
PMN

The number of events in the PMN area (1) of the BASO cytogram.

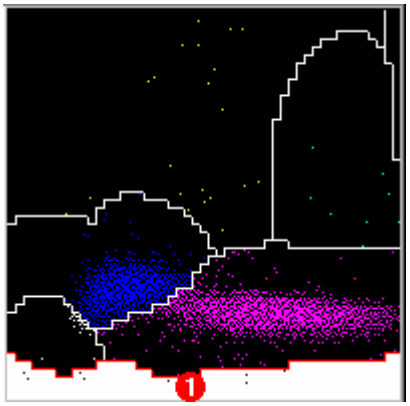



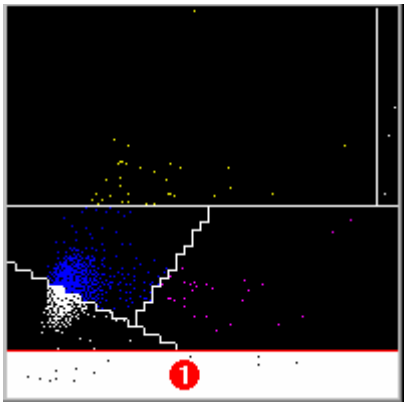
MN

The number of events in the MN area (1) of the BASO cytogram.

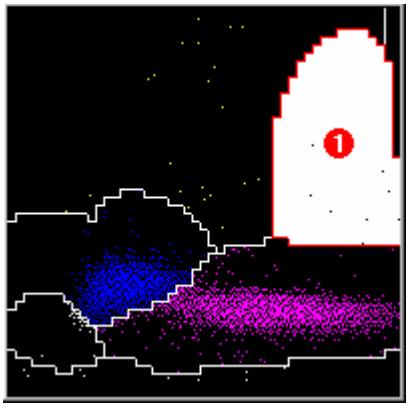



Noise
The number of events in the Noise area (1) of the BASO cytogram.





BASO Suspect
The number of events in the Baso Suspect area (1) of the BASO cytogram.



RawWBC
BASO Valid Cells x (BASO PHA Cells ÷ BASO PHA Total)

BasoCalFactor
The sampler-specific calibration factor:

BasoCalFactor = BASO WBC (AS) x 0.0012475

BasoCalFactor = BASO WBC (MCTS) x 0.0012475

BasoCalFactor = BASO WBC (OTS) x 0.0012475

To view the BASO WBC calibration factors, click **Cal/Gain Logs** on the System Logs menu.

FracDT
The fraction of time that the channel is busy processing flowcell events. While the baso channel is busy identifying a particular flowcell event, it is unable to process any additional events that might occur. By measuring this "dead time", the analyzer can compensate for these events.

CSF Method

Cytochemical Reactions

The ADVIA 22120/2120i/22120/2120ii CSF Assay provides a rapid, automated analysis of CSF samples by counting and distinguishing certain cell types. When using the ADVIA 22120/2120i/22120/2120ii CSF Assay, the CSF sample is mixed with ADVIA 2120/2120i CSF Reagent, which spheres and fixes the cells. After a minimum 4-minute to 4-hour incubation period, the prepared sample is then aspirated directly into the ADVIA 22120/2120i/22120/2120ii system.

Measurement

The ADVIA 22120/2120i/22120/2120ii CSF Assay provides a rapid, automated analysis of CSF samples by counting and distinguishing certain cell types. When using the ADVIA 22120/2120i/22120/2120ii CSF Assay, the CSF sample is mixed with ADVIA 2120/2120i CSF Reagent, which spheres and fixes the cells. After a minimum 4-minute to 4-hour incubation period, the prepared sample is then aspirated directly into the ADVIA 22120/2120i/22120/2120ii system. The cells are then detected and enumerated based on light scatter and absorbance measurements using the ADVIA 22120/2120i/22120/2120ii laser optics. A scatter versus scatter and scatter versus absorbance cytogram is displayed with the thresholds and results automatically calculated for each sample. Reportable parameters are WBC and RBC counts along with absolute and percentage counts for neutrophils, lymphocytes, monocytes, polymorphonuclear (PMN), and mononuclear (MN) cells. A research-use-only eosinophil count is also given.

CSF Scatter/Scatter Cytogram

The CSF Scatter/Scatter Cytogram is a 100 x 100-channel, two-dimensional, pulse height distribution of the scatter high and scatter low data for WBC, RBC, and noise, where the X-axis is high-angle scatter and the Y-axis is low angle scatter. A fixed mask is used to set thresholds for Neutrophil, Lymphocyte, Monocyte and RBC regions. Eosinophils fall within the Neutrophil region in this cytogram. The number of eosinophils is determined from the Scatter/Absorption cytogram and is subtracted from the number of cells in the Neutrophil region prior to calculating WBC and Neutrophil parameters. At this time, eosinophil data is for research purposes only and is non-reportable

CSF Scatter/Absorption Cytogram

The CSF Scatter/Absorption Cytogram is a 100 x 100-channel, two-dimensional, pulse height distribution of the scatter high and absorption data for WBC, RBC, and noise, where the X-axis is absorption and the Y-axis is high angle scatter. A fixed mask is used to set the threshold for eosinophil analysis. Because of their higher absorption, eosinophils fall to the right of the neutrophil population in this cytogram and are thus able to be separated from the neutrophil population. The number of eosinophils is subtracted from the number of cells falling in the neutrophil region of the Scatter/Scatter cytogram before calculating WBC and Neutrophil parameters.

Calculating Parameters

Reported Parameters

The following parameters are available for patient reporting:

Parameter	Explanation
CSF WBC	CSF WBC/µL = (CSF PHA WBC / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
%CSF PMN	%CSF PMN = 100 x CSF PMN / CSF WBC
#CSF PMN	#CSF PMN/µL = (CSF PHA PMN / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
%CSF MN	%CSF MN = 100 x CSF MN / CSF WBC
#CSF MN	#CSF MN/µL = (CSF PHA MN / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
%CSF Neut	%CSF Neut = 100 x CSF Neut / CSF WBC
#CSF Neut	#CSF Neut/µL = (CSF PHA Neut / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
%CSF Lymph	%CSF Lymph = 100 x CSF Lymph / CSF WBC
#CSF Lymph	#CSF Lymph /µL = (CSF PHA Lymph / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
%CSF Mono	%CSF Mono = 100 x CSF Mono / CSF WBC
#CSF Mono	#CSF Mono/µL = (CSF PHA Mono / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
CSF RBC	CSF RBC/µL = (CSF R Count / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
%CSF Eos	%CSF Eos = 100 x CSF Eos / CSF WBC
#CSF Eos	#CSF Eos/µL = (CSF PHA Eos / CSF PHA Total x CSF PHA Cells) / (1-Fractional Dead Time) x Perox Nominal Factor
CSF PHA Total	The total number of cells displayed in the CSF Scatter/Scatter cytogram including the noise region.
CSF PHA Cells	The total number of cells displayed in the CSF Scatter/Scatter cytogram excluding the noise region.
CSF %Noise	The percentage of cells that are located in the noise region of the CSF Scatter/Scatter cytogram.
CSF PHA WBC	The number of cells falling into the WBC regions of the CSF Scatter/Scatter cytogram.
CSF PHA Eos	The number of cells falling in the Eosinophil Region of the CSF Scatter/Absorption cytogram.
CSF PHA Lymphs	The number of cells falling in the Lymphocyte Region of the CSF Scatter/Scatter cytogram.
CSF PHA Monos	CSF PHA Monos is the number of cells falling in the Monocyte Region of the CSF Scatter/Scatter cytogram.
CSF PHA Neuts	The number of neutrophils falling in the Neutrophil Region of the CSF Scatter/Scatter cytogram. Due to their scatter/scatter properties, both neutrophils and eosinophils fall in this region of the CSF Scatter/Scatter cytogram. The number of CSF PHA Eos is identified in the Eosinophil Region of the CSF Scatter/Absorption cytogram and subtracted from the number of cells in the Neutrophil Region of the CSF Scatter/Scatter cytogram to determine the CSF PHA Neuts. CSF PHA Neuts = # cells in Neutrophil Region (CSF Scatter/Scatter Cytogram) – CSF PHA Eos (CSF Scatter/Absorption Cytogram)

Parameter	Explanation
CSF R Count	The number of cells falling in the Red Cell Region of the CSF Scatter/Scatter cytogram.

Parameter Key

CSF WBC
The reportable CSF white blood cell count (WBC/µL).

CSF PMN
The reportable CSF absolute polymorphonuclear cell count.

%CSF PMN
The reportable CSF differential percentage polymorphonuclear cell count.

#CSF MN
The reportable CSF absolute mononuclear cell count.

%CSF MN
The reportable CSF differential percentage mononuclear cell count.

#CSF Neut
The reportable CSF absolute neutrophil cell count.

%CSF Neut
The reportable CSF differential percentage neutrophil cell count.

#CSF Lymph
The reportable CSF absolute lymphocyte cell count.

%CSF Lymph
The reportable CSF differential percentage lymphocyte cell count.

#CSF Mono
The reportable CSF absolute monocyte cell count.

%CSF Mono
The reportable CSF differential percentage monocyte cell count.

CSF RBC
The reportable CSF red blood cell count (RBC/µL).

CSF WBC
The reportable CSF white blood cell count (WBC/µL).

CSF PMN
The reportable CSF absolute polymorphonuclear cell count.

%CSF PMN
The reportable CSF differential percentage polymorphonuclear cell count.

#CSF MN
The reportable CSF absolute mononuclear cell count.

%CSF MN
The reportable CSF differential percentage mononuclear cell count.

#CSF Neut
The reportable CSF absolute neutrophil cell count.

%CSF Neut
The reportable CSF differential percentage neutrophil cell count.

#CSF Lymph
The reportable CSF absolute lymphocyte cell count.

%CSF Lymph
The reportable CSF differential percentage lymphocyte cell count.

#CSF Mono
The reportable CSF absolute monocyte cell count.

%CSF Mono
The reportable CSF differential percentage monocyte cell count.

CSF RBC
The reportable CSF red blood cell count (RBC/µL).

%CSF Eos
The research-only CSF differential percentage eosinophil cell count.

#CSF Eos
The research-only CSF absolute eosinophil cell count.

Hemoglobin Method

Chemical Reactions

The ADVIA 22120/2120i/22120/2120ii Hematology system normally uses a cyanide-free hemoglobin method, but can be configured to use a reagent that contains cyanide.

The sample and the ADVIA 2120/2120i CN-FREE HGB reagent or ADVIA 2120/2120i HGB reagent are mixed in the hemoglobin reaction chamber (colorimeter). The hemoglobin chemical reactions consist of two steps:

ADVIA CN-FREE HGB Reagent

Step 1 Red blood cells are lysed to release hemoglobin

Step 2 The heme iron in the hemoglobin is oxidized from the ferrous to the ferric state and coordinates one hydroxide ion and one water molecule as an axial ligand to form monoaquomonohydroxyferri-porphyrin as the reaction product.

ADVIA HGB Reagent

Step 1 Red blood cells are lysed to release hemoglobin.

Step 2 The heme iron in the hemoglobin is oxidized from the ferrous to the ferric state, and is then combined with cyanide in the ADVIA 2120/2120i HGB reagent to form the reaction product.

ADVIA 2120/2120i HGB

NOTE: For more detailed information on the contents of ADVIA 2120/2120i HGB reagent, please see Chapter 8.

ADVIA 2120/2120i HGB reagent contains a surfactant and potassium cyanide, which are dissolved in an alkaline borate solution at pH 11.3.

The surfactant hemolyzes the red blood cells and then emulsifies the cellular debris and lipids in a reaction mixture that is essentially free of turbidity.

After release of hemoglobin by hemolysis, the combined action of an alkaline pH and the surfactant causes a rapid denaturation of the protein with solubilization of the hemes by surfactant micelles.

The hemes then undergo air oxidation of ferrous iron to the ferric state and combine with cyanide forming micellized ferriheme. Published studies show that each ferriheme combines with two cyanide ions.

The mechanism and clinical performance of the Siemens Hemoglobin method have been described. The presence of carboxyhemoglobin (even up to 100%) has no effect on the reaction rate or transformation to the cyanated product.

Bibliography

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Simplicio and Schwenzer, *Biochem* **12**:1923 (1983)

Malin MJ, Sclafani LD and Wyatt JL: Evaluation of 24-second cyanide-containing and cyanide-free methods for whole blood hemoglobin on the Technicon H-1 analyzer with normal and abnormal blood samples. *Am J Clin Path* **92**:286 (1989)

Malin MJ, Fan SS and Benezra J: Mechanism of automated alkaline methods for the determination of hemoglobin in whole blood based on the micellization of ligated heme in the presence and absence of cyanide. *Anal Chim Acta* **262**:67 (1992)

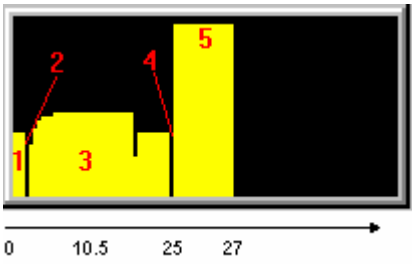
Measurement

Optical readings are obtained colorimetrically at 565 or 546 nm according to the method installed.

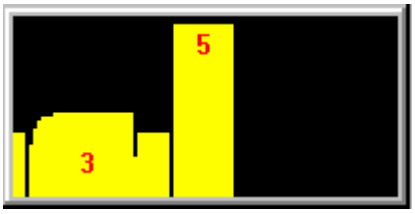
After processing, the optical data are plotted on the hemoglobin rate curve where time in seconds is plotted along the x axis, and the percent light transmission is plotted along the y axis.

The hemoglobin transmission histogram is divided into five parts:

HGB Trans



1. ADVIA2120/2120i SHEATH/RINSE reading from previous cycle
2. Draining of the ADVIA 2120/2120i SHEATH/RINSE, and refilling with the reaction solution consisting of sample and ADVIA 2120/2120i HGB reagent
3. Reaction solution readings (15.5s to 18.0s) - Sample Mean
4. Draining of the reaction solution, and refilling with ADVIA 2120/2120i SHEATH/RINSE
5. ADVIA 2120/2120i SHEATH/RINSE readings (baseline transmittance) for the current sample – Baseline Mean value should be between 2.5 and 4.1.



Sample readings (3): sample and ADVIA 2120/2120i HGB reagent

$$\text{Sample Mean} = \frac{\sum \text{Sample Counts}}{N}$$

Baseline readings (5): ADVIA 2120/2120i SHEATH/RINSE

$$\text{Baseline Mean} = \frac{\sum \text{Baseline Counts}}{N}$$

Calculating Parameters

Reported Parameters

The following parameters are available for patient reporting:

Parameter	Explanation
HGB	log (Sample Mean ÷ Baseline Mean) x Hgb Cal Factor x 50.0
MCH	(HGB ÷ RBC) x 10
MCHC	(HGB ÷ [RBC x MCV]) x 1000

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
Calculated HGB	(CHCM x RBC x MCV) ÷ 1000
Delta HGB	HGB - Calculated HGB
HGB Baseline Transmission	Baseline Mean x 3.05194E-4
HGB Sample Transmission	Sample Mean x 3.05194E-4
HGB Baseline Flatness	Maximum Baseline Value - Minimum Baseline Value
HGB Sample Flatness	Maximum Sample Value - Minimum Sample Value

Parameter Key

HGB
Measured hemoglobin concentration

MCH
Mean Corpuscular Hemoglobin

MCHC
Mean Corpuscular Hemoglobin Concentration

Calculating the HGB Result Using CHCM

The Corpuscular Hemoglobin Concentration Mean (CHCM) and Mean Corpuscular Hemoglobin Concentration (MCHC) both provide a measurement of the average corpuscular hemoglobin concentration in the sample. The CHCM is a directly measured parameter based on a cell-by-cell analysis, while the MCHC is a calculated parameter based on the HGB, MCV, and RBC results.

If they differ by more than 1.9 g/dL, a Comparison Error MCHC / CHCM (CHCMCE) sample/system flag alerts operators to a condition that could be affecting one or more of the three results (RBC, MCV or HGB) used to calculate MCHC.

For example, severe lipemia is a known interference that can falsely elevate a HGB result obtained from the colorimetric hemoglobin method. When the hemoglobin is falsely increased, the MCHC is also falsely increased.

Using CHCM to calculate HGB avoids this interference since CHCM is directly measured and is virtually unaffected by lipemia. To calculate HGB, replace MCHC with CHCM as follows:

MCHC = (HGB ÷ [RBC x MCV]) x 1000

HGB = (MCHC x RBC x MCV) ÷ 1000

Calculated HGB = (CHCM x RBC x MCV) ÷ 1000 or (CHCM x Hct) ÷ 100

The Measured HGB and Calculated HGB values are displayed on the HGB panel of the Run Screen.

Peroxidase Method

Cytochemical Reactions

The peroxidase cytochemical reactions consist of three steps:

Step 1 Red blood cells are lysed using ADVIA 2120/2120i PEROX 1 reagent and the high temperature in the reaction chamber.

Step 2 White blood cells are fixed using ADVIA 2120/2120i PEROX 1 reagent.

Step 3 White blood cells are stained using ADVIA 2120/2120i PEROX 2 reagent and ADVIA 2120/2120i PEROX 3 reagent.

White blood cells are identified based on size and different intensity of peroxidase reaction (staining).

Neutrophils, eosinophils, and monocytes are stained based on their levels of peroxidase activity. Since lymphocytes, basophils, and large unstained cells contain no peroxidase, these cell types remain unstained.

Perox Temperature Control

Temperature control is critical to lysing the red blood cells. The perox reaction chamber temperature, which is automatically monitored by the analyzer, must be between 58°C and 72.1°C.

If you want to check the perox reaction chamber temperature, use the Analyzer Status tab.

If you need to adjust the perox reaction chamber temperature:

1. At the Special Procedures menu, select **Adjust Lamp / Temp**.
2. Select **Perox Temperature**.

ADVIA 2120/2120i PEROX 1

NOTE: For more detailed information on the contents of ADVIA 2120/2120i PEROX 1 reagent, please see Chapter 8.

ADVIA 2120/2120i PEROX 1 is the first reagent added to whole blood sample in the heated peroxidase reaction chamber. Its function is to lyse the red blood cells and fix the white blood cells.

Surfactants (sodium dodecyl sulfate and Brij-35) in combination with thermal stress lyse the red blood cells.

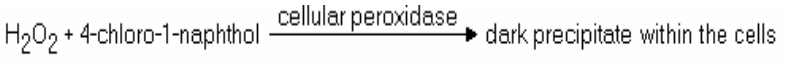
Formaldehyde fixes the white blood cells. The hypertonic environment causes some shrinkage and crenation of the white cells. This increases the refractive index of the cells and enhances the detection of lymphocytes over noise.

ADVIA 2120/2120i PEROX 2

NOTE: For more detailed information on the contents of ADVIA 2120/2120i PEROX 2 reagent, please see Chapter 8.

ADVIA 2120/2120i PEROX 2 and ADVIA 2120/2120i PEROX 3 are added to the peroxidase reaction chamber in the second reagent addition.

The 4-Chloro-1-naphthol in ADVIA 2120/2120i PEROX 2 serves as a substrate that enables the hydrogen peroxide in ADVIA 2120/2120i PEROX 3 to form a dark precipitate at endogenous sites of peroxidase activity in the granules of white blood cells, as described by the following equation:

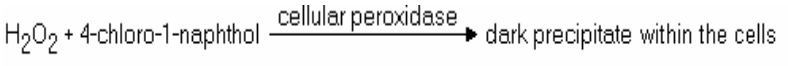


ADVIA 2120/2120i PEROX 3

NOTE: For more detailed information on the contents of ADVIA 2120/2120i PEROX 3 reagent, please see Chapter 8.

ADVIA 2120/2120i PEROX 2 and ADVIA 2120/2120i PEROX 3 are added to the peroxidase reaction chamber in the second reagent addition.

The 4-Chloro-1-naphthol in ADVIA 2120/2120i PEROX 2 serves as a substrate that enables the hydrogen peroxide in ADVIA 2120/2120i PEROX 3 to form a dark precipitate at endogenous sites of peroxidase activity in the granules of white blood cells, as described by the following equation:



ADVIA 2120/2120i PEROX SHEATH

NOTE: For more detailed information on the contents of ADVIA 2120/2120i PEROX SHEATH reagent, please see Chapter 8.

ADVIA 2120/2120i PEROX SHEATH has three important functions:

- To constrict the sample stream so that only one cell at a time can pass through the viewing area.
- To prevent contact between the sample stream and the flowcell walls. This prevents clogs and staining of the flowcell.
- To provide an optically transparent medium through which the sample stream can be clearly focused.

Measurement

A constant volume of the cell suspension from the Perox reaction chamber passes through the flowcell where the absorption (peroxidase staining) and the forward light-scattering (size) signatures of all white blood cells are measured.

ADVIA 2120/2120i PEROX SHEATH encases the sample stream as the two fluids pass through the flowcell.

The light-scatter and the light-absorption signals are detected and electronically amplified. After processing, the following information is available:

PEROX Rate histogram displays the arrival rate of cells in the Perox channel.

PEROX X histogram displays the absorption values for all cells. Information from the noise area is excluded.

PEROX Y histogram displays the light scattering values for all events, including those from the noise area.

Noise-Lymph histogram provides the light scattering values for the noise, lymphocyte, and large unstained cells (LUC) areas. Information from the monocyte, neutrophil, and eosinophil areas is excluded.

PEROX Cytogram is formed from the paired light scatter and absorption data. Cluster analysis identifies the individual populations.

Perox Rate Histogram



The PEROX Rate histogram shows the uniformity of the cell-counting rate.

The rate histogram data consists of 50 points, one taken every 200 milliseconds. Each point represents the number of valid cells counted during the last 200 milliseconds.

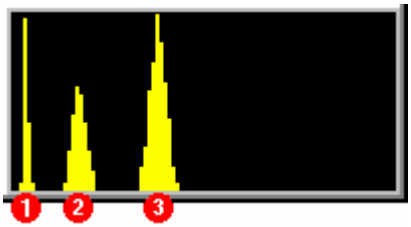
Perox X Histogram



PEROX X histogram displays the absorption values for all cells. Information from the noise area is excluded.

Increasing channel numbers on the PEROX X histogram correspond to greater intensity of peroxidase staining.

Perox Y Histogram



1 Noise

2 Lymphocytes

3 Large Unstained Cells (LUC)

PEROX Y histogram displays the light scattering values for all events, including those from the noise area.

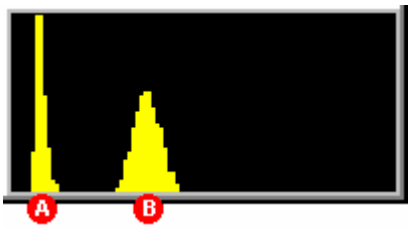
Increasing channel numbers on the PEROX Y histogram correspond to greater cell size (volume).

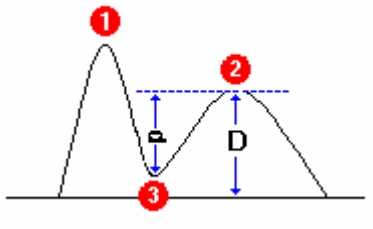
Noise–Lymph Histogram

The Noise-Lymph histogram provides the light scattering values for the noise, lymphocyte, and large unstained cells (LUC) areas.

The Noise-Lymph histogram is used to derive the following parameters:

- The mode channel of the noise population on the y axis (1)
- The peak channel (Lymph Mode) of the lymphocyte population on the y axis (2)
- The valley channel (Noise-Lymph Valley) that separates the noise and lymphocyte populations (3)
- The relative depth of the valley as expressed by d/D (PEROX d/D).





A Noise

B Lymphocytes

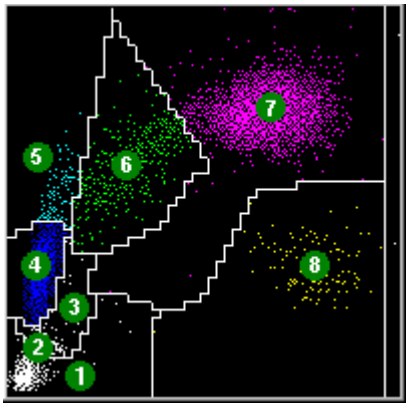
PEROX Cytogram

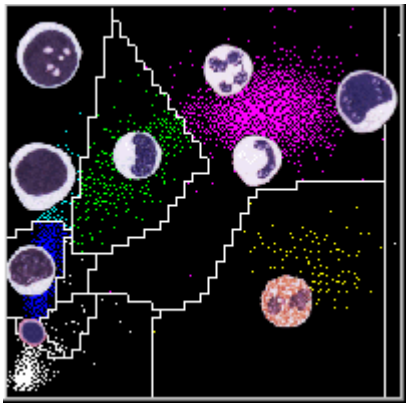
The PEROX cytogram is divided into 100 counting channels on each axis. The cells absorb light proportional to the amount of peroxidase stain present, and this is represented on the x axis. Cells scatter light proportional to their size, and this is represented on the y axis.

When the light scatter and absorption data are plotted, distinct populations or clusters are formed.

Cluster analysis identifies each population based on its position, area, and density, and then the number of cells in each population is processed. The lines that separate the different cell populations are calculated by the software on a sample-by-sample basis.

The following PEROX cytograms were obtained from a representative patient specimen.





1 Noise
2 Nucleated Red Blood Cells
3 Platelet Clumps
4 Lymphocytes and Basophils
5 Large Unstained Cells
6 Monocytes
7 Neutrophils
8 Eosinophils

Noise
This area contains Platelets, RBC stroma, and debris that are excluded from the Total White Count (WBCP) and WBC differential.

Nucleated Red Blood Cells
If present, nucleated red blood cells appear in this area because of their small size and lack of peroxidase staining. The system uses data from the perox channel and the baso channel to derive the Nucleated Red Blood Cell (NRBC) count (%NRBC and #NRBC). If NRBCs are present, the system corrects the WBC results to account for them.

Platelets Clumps
If present, platelet clumps appear in this area. The platelet clump count is not included in the WBCP and differential, but it is monitored for flagging purposes.

Lymphocyte and Basophil Cluster
Lymphocytes and Basophils appear in the same cluster because they have similar size and no peroxidase activity.

LUC Cluster
The LUC cluster contains Large Unstained Cells (atypical lymphocytes, blasts, and other abnormal cells).

Monocyte Cluster
Monocytes are medium-sized cells with some peroxidase activity.

Neutrophil Cluster
Neutrophils are large cells with strong peroxidase activity.

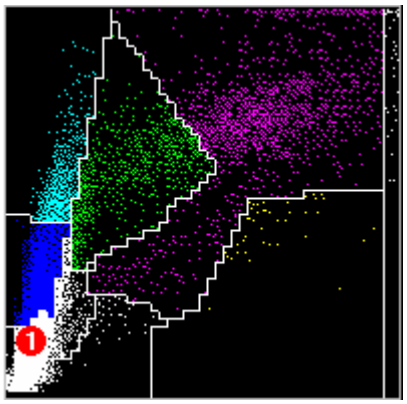
Eosinophil Cluster
Eosinophils have the most peroxidase activity of all the white blood cell types and are large cells, approximately the same size as neutrophils.

Eosinophils stain so intensely that they absorb light that would otherwise be scattered. Consequently, eosinophils appear somewhat smaller than neutrophils and can be separated from them.

Abnormal Cell Locations

If abnormal cells are present, their size and peroxidase activity determine their location on the PEROX cytogram.

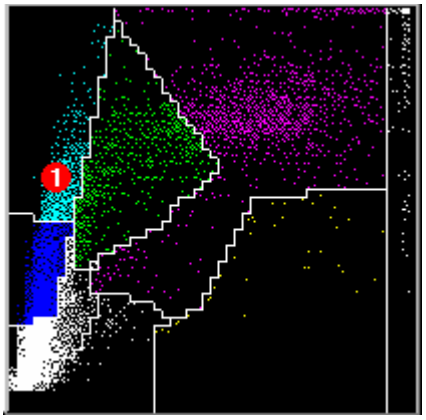
Location of nRBCs on PEROX Cytogram



Nucleated Red Blood Cells (nRBCs) appear in the NRBC cluster (1), which is located between the Noise and Lymphocyte areas.

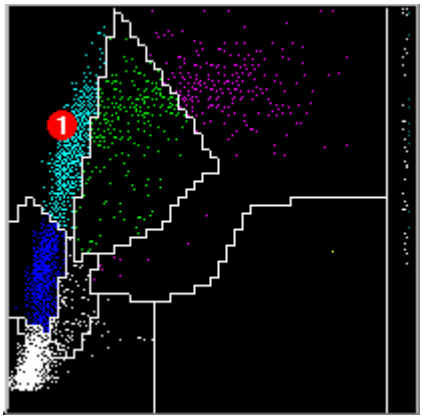
The system uses data from the perox channel and the baso channel to derive the Nucleated Red Blood Cell (NRBC) count (%NRBC and #NRBC). If nRBCs are present, the system corrects the WBC results to account for them.

Location of Atypical Lymphocytes on PEROX Cytogram



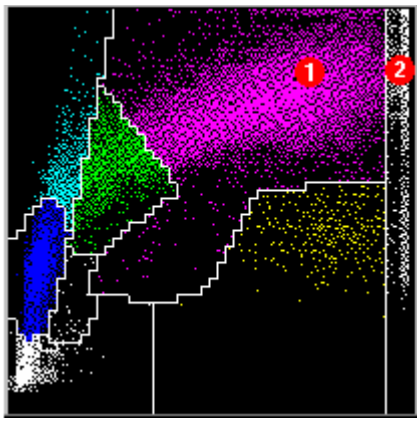
Atypical lymphocytes are large cells with no peroxidase activity that can appear in the LUC area (1).

Location of Blasts on PEROX Cytogram



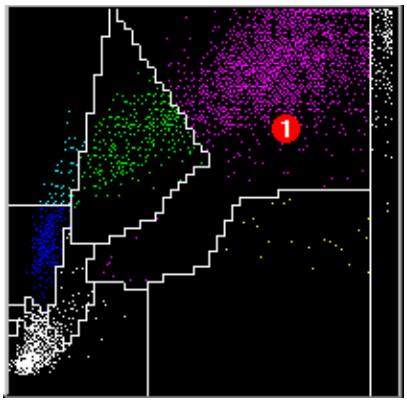
Similarly, **blasts** and other large abnormal cells with no peroxidase activity also appear in the LUC area (1).

Location of Immature Granulocytes on PEROX Cytogram



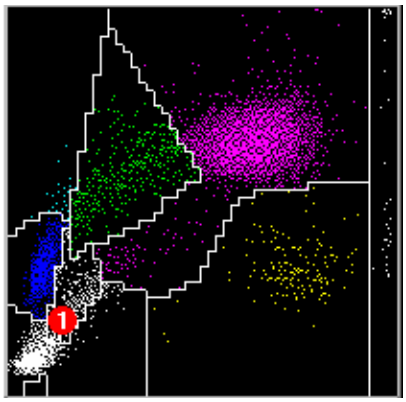
Immature Granulocytes are large cells with high peroxidase activity that can appear in the neutrophil area (1) and the saturation area (2).

Location of Bands on PEROX Cytogram



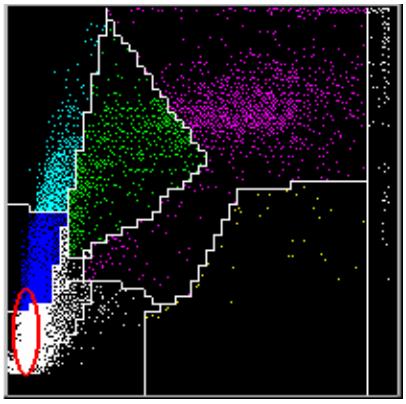
Bands appear within the the Neutrophil population (1) due to their similar size and degree of peroxidase staining.

Location of Platelet Clumps on PEROX Cytogram



Platelet Clumps form a separate cluster (1) that originates in the Noise area on the PEROX cytogram.

Location of Unlysed RBCs on PEROX Cytogram



Unlysed RBCs with no peroxidase activity appear along the left side of the PEROX cytogram.

Calculating Parameters

Reported Parameters

Parameter	Explanation
WBCP	RawWBC x (PeroxCalFactor ÷ [1-FracDT])
%NEUT	(100 x Neutrophil Count) ÷ PHA Cells
#NEUT	(%NEUT ÷ 100) x WBC
%LYMPH	([100 x Lymphocyte Count] ÷ PHA Cells) - %BASO
#LYMPH	(%LYMPH ÷ 100) x WBC
%MONO	(100 x Monocyte Count) ÷ PHA Cells
#MONO	(%MONO ÷ 100) x WBC
%EOS	(100 x Eosinophil Count) ÷ PHA Cells
#EOS	(%EOS ÷ 100) x WBC

%LUC	(100 x LUC Count) ÷ PHA Cells
#LUC	(%LUC ÷ 100) x WBC

The system uses data from the perox channel and the baso channel to derive the Nucleated Red Blood Cell (NRBC) count (%NRBC and #NRBC). If nRBCs are present, the system corrects the WBC results to account for them.
The system can also display Peroxidase channel and Basophil/Lobularity channel WBC counts and the associated differential counts that have not been corrected for NRBCs, even if NRBC counts are reported. The uncorrected counts are designated by a lower case "u".

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
%HPX	100 x (HPX ÷ PHA Cells)
Clumps Count	Number of events in the Platelet Clumps area of the PEROX cytogram
Valley Count	Number of events in the NRBC area of the PEROX cytogram
Lymph Mode	Mode channel of the Lymphocyte cluster
MPXI	$\frac{(\text{X Mean of Sample Neut - Expected staining index})}{\text{Expected staining index}} * 100$
NEUT X	Mean X channel for neutrophil cluster
NEUT Y	Mean Y channel for neutrophil cluster
Noise/Lymph Valley	Valley channel between Noise and Lymph clusters
Perox d/D	$\frac{\text{Lymph Mode Count - Noise / Lymph Valley Count}}{\text{Lymph Mode Count}}$
PEROX % Dead Time	100 x FracDT
PEROX % Noise	100 x (Noise ÷ PHA Cells)
PEROX % Saturation	100 x (Perox Saturation ÷ PHA Cells)
PEROX Flatness	$\sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$

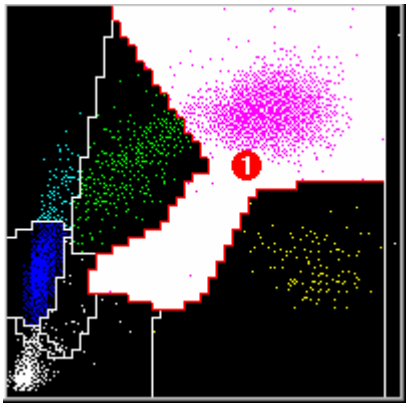
Parameter Key

WBCP
The white blood cell count from the Peroxidase method.

%NEUT
The percent of neutrophils.

#NEUT
The absolute count of neutrophils.

Neutrophil Count

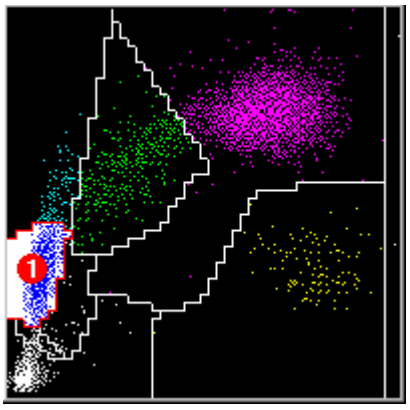


The number of events in the Neutrophil area (1) of the PEROX cytogram.

%LYMPH
The percent of lymphocytes.

#LYMPH
The absolute count of lymphocytes.

Lymphocyte Count

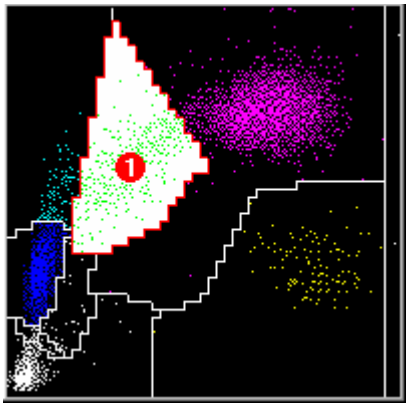


The number of events in the Lymphocyte area (1) of the PEROX cytogram.

%MONO
The percent of monocytes.

#MONO
The absolute count of monocytes.

Monocyte Count

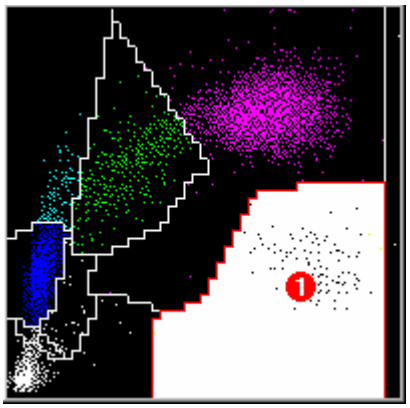


The number of events in the Monocyte area (1) of the PEROX cytogram.

%EOS
The percent of eosinophils.

#EOS
The absolute count of eosinophils.

Eosinophil Count

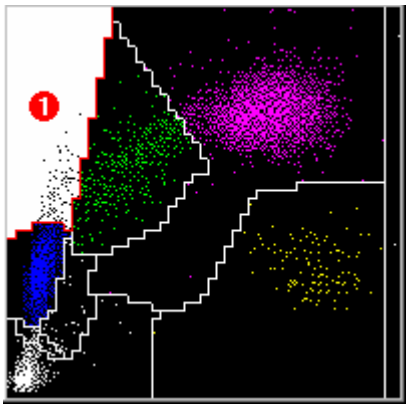


The number of events in the Eosinophil area (1) of the PEROX cytogram.

%LUC
The percent of large unstained cells.

#LUC
The absolute count of large unstained cells.

Large Unstained Cell Count



The number of events in the LUC area (1) of the PEROX cytogram.

RawWBC
Perox Valid Cells x (PHA Cells ÷ PHA Total)

PeroxCalFactor
The sampler-specific calibration factor:

PeroxCalFactor = PEROX WBC (AS) x 0.001248

PeroxCalFactor = PEROX WBC (MCTS) x 0.001248

PeroxCalFactor = PEROX WBC (OTS) x 0.001248

To view the PEROX WBC calibration factors, select **Cal/Gain Logs** at the System Logs menu.

FracDT
The fraction of time that the channel is busy processing flowcell events. While the perox channel is busy identifying a particular flowcell event, it is unable to process any additional events that might occur. By measuring this "dead time", the analyzer can compensate for these events.

MPXI
The mean peroxidase activity index or staining intensity of the neutrophil population relative to the archetype.

PEROX PHA Cells (P-acq)
The total number of events in the PEROX cytogram excluding the Noise area.

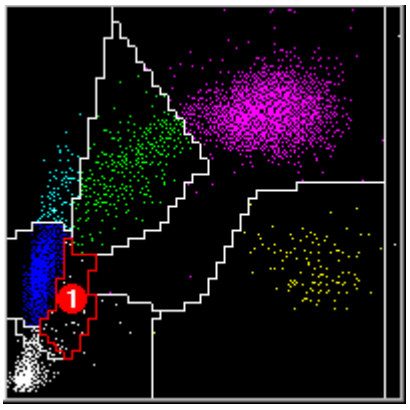
NOTE: nRBC and PLT Clump events are components of Perox Noise. Therefore, they are not included in the PEROX PHA Cells.

PEROX PHA Total (P-tot)
The total number of events in the PEROX cytogram including the Noise area.

Perox Valid Cells (P-vc)
The number of valid electronic pulse signals detected from flowcell events.

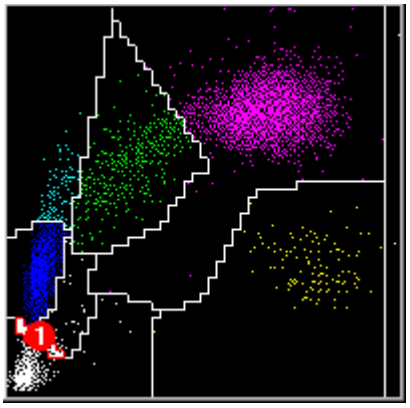
HPX
The number of events with absorption values greater than 1.4 times the X channel mean of the neutrophil cluster.

Clumps Count



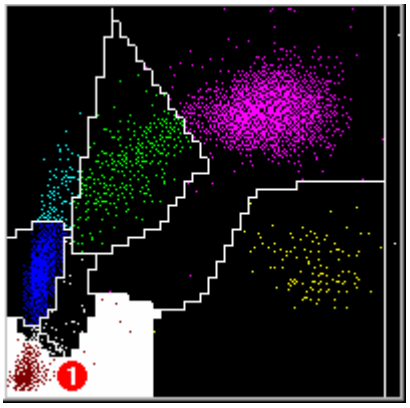
The number of events in the Platelet Clumps area (1) of the PEROX cytogram.

Valley Count



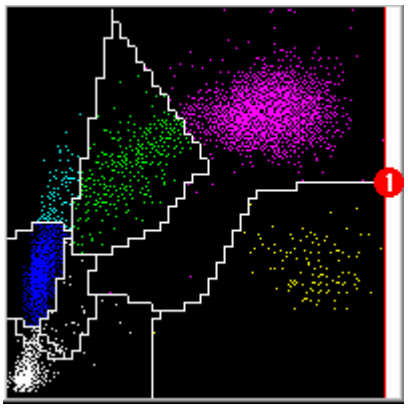
The number of events in the NRBC area (1) of the PEROX cytogram.

Perox Noise



The number of events in the Noise area (1) of the PEROX cytogram.

Perox Saturation



The number of events in the Saturation area (1) of the PEROX cytogram.

RBC / Platelet Method

Cytochemical Reactions

The RBC/Platelet cytochemical reactions consist of two steps:

Step 1 RBCs and platelets are isovolumetrically sphered using the ADVIA 2120/2120i RBC/PLT reagent.

Step 2 RBCs and platelets are fixed.

ADVIA 2120/2120i RBC / PLT

NOTE: For more detailed information on the contents of ADVIA 2120/2120i RBC / PLT reagent, please see Chapter 8.

ADVIA 2120/2120i RBC/PLT reagent contains sodium dodecyl sulfate (SDS) and glutaraldehyde, which causes sphering of the red blood cells and platelets. When red cells and platelets are isovolumetrically sphered, shape is eliminated as a variability factor.

Measurement

A constant volume of the cell suspension from the RBC reaction chamber passes through the flowcell where the low-angle light scatter (2° to 3°) and high-angle light scatter (5° to 15°) signatures of each cell are measured.

ADVIA 2120/2120i SHEATH/RINSE encases the sample stream as the two fluids pass through the flowcell.

The two light-scatter signals are detected, electronically amplified, and split into four signals:

- A pair of low-angle light scatter (2° to 3°) and high-angle light scatter (5° to 15°) signals are used to analyze red blood cells.
- A low-angle light scatter (2° to 3°) signal is amplified 30 times, and a high-angle light scatter (5° to 15°) signal is amplified 12 times. These signals are used to analyze platelets.

Measurement: RBC Method

A pair of low-angle light scatter (2° to 3°) and high-angle light scatter (5° to 15°) signals are used to analyze red blood cells.

Using the Mie theory of light scattering for homogeneous spheres, the low-angle light scatter measurement is converted into cell volume and the high-angle light scatter measurement is converted into hemoglobin concentration.

The following histograms and cytograms are used for red blood cell analysis:

RBC Rate histogram shows the arrival rate of cells in the RBC/Platelet channel.

RBC Volume histogram shows the distribution of red cells by cell volume.

RBC HC histogram shows the distribution of red cells by hemoglobin concentration independent of cell volume.

RBC CH histogram shows the distribution of red cells by hemoglobin content.

RBC Scatter cytogram is formed by plotting the high-angle light scatter (5° to 15°) along the x axis and the low-angle light scatter (2° to 3°) on the y axis.

RBC V/HC cytogram is a presentation of the RBC volume and Hgb concentration data intended for evaluating red cell morphology.

RBC Matrix provides the cell counts and percentages for the corresponding nine regions on the RBC V/HC cytogram.

Measurement: Platelet Method

A low-angle light scatter (2° to 3°) signal is amplified 30 times, and a high-angle light scatter (5° to 15°) signal is amplified 12 times. These "high-gain" signals are used to analyze platelets.

Using the Mie theory of light scattering for homogeneous spheres, the low-angle, high-gain light scatter measurement is converted into cell volume and the high-angle, high-gain light scatter measurement is converted into refractive index (n).

The following histograms and cytograms are used for platelet analysis:

Platelet X histogram is formed from the high-angle (5° to 15°), high-gain light scatter signals.

Platelet Y histogram is formed from the low-angle (2° to 3°), high-gain light scatter signals.

Platelet Vol histogram shows the distribution of platelets by cell volume.

Platelet PM histogram shows the distribution of platelets by dry mass.

Platelet PC histogram shows the distribution of platelets by refractive index.

PLT Scatter cytogram is formed by plotting the high-angle (5° to 15°), high-gain light scatter signals along the x axis and the low-angle (2° to 3°), high-gain light scatter signals on the y axis.

PLT Volume PC cytogram is formed by plotting the refractive index of platelets (PC) along the x axis and the platelet volume on the y axis.

Bibliography

Tycko DH, Metz MH, Epstein EA, Grinbaum: Flow-cytometric light scattering measurement of red blood cell volume and hemoglobin concentration. *Applied Optics* **24(9)**:1355-1365 (1985)

RBC Rate Histogram



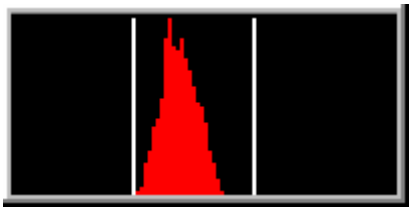
The RBC Rate histogram shows the uniformity of the cell-counting rate.

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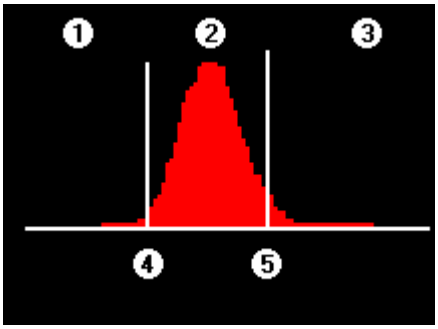
The rate histogram data consists of 50 points, one taken every 200 milliseconds. Each point represents the number of valid cells counted during the last 200 milliseconds

RBC Volume Histogram

The RBC Volume histogram represents the distribution of red blood cells by cell volume. The histogram has a range of 0 fL to 200 fL.



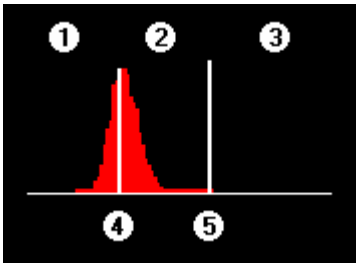
RBC Volume histogram (normal sample)



1 Microcytic region
2 Normocytic region
3 Macrocytic region
4 60 fL marker
5 120 fL marker

Normal samples have a bell-curve shaped distribution with a mode channel between 60 fL and 120 fL. The mean corpuscular volume (MCV) and the red cell distribution width (RDW) are determined from this histogram. The MCV is the mean of the of RBC Volume histogram. The RDW is the coefficient of variation of the population. The MCV calibration factor has been applied to the displayed data.

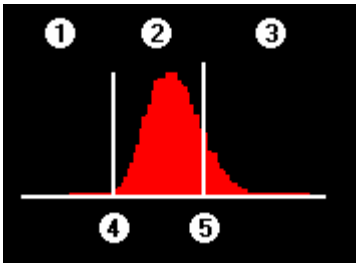
RBC Volume histogram (microcytic sample)



1 Microcytic region
2 Normocytic region
3 Macrocytic region
4 60 fL marker
5 120 fL marker

In samples with increased numbers of microcytic red blood cells, the histogram curve shifts to the left, indicating an increase in the percentage of the cells with volumes less than 60 fL.

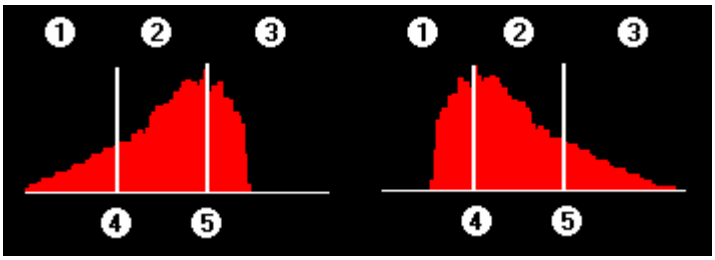
RBC Volume histogram (macrocytic sample)



1 Microcytic region
2 Normocytic region
3 Macrocytic region
4 60 fL marker
5 2120/2120i fL marker

In samples with increased numbers of macrocytic red blood cells, the histogram curve shifts to the right, indicating an increase in the percentage of the cells with volumes greater than 2120/2120i fL.

RBC Volume histogram (anisocytosis)

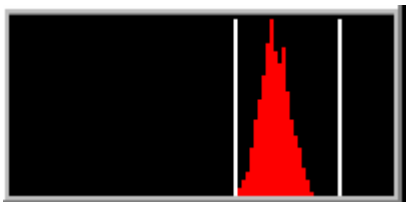


1 Microcytic region
2 Normocytic region
3 Macrocytic region
4 60 fL marker
5 120 fL marker

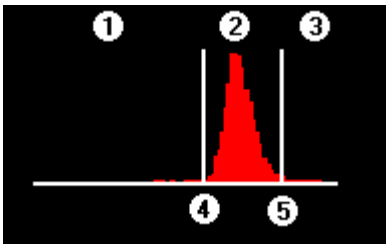
RDW is monitored as an indication of anisocytosis, and the results are flagged if the RDW exceeds 16%. Note that two specimens with the same RDW value can have different degrees of microcytosis and macrocytosis.

RBC HC Histogram

The RBC hemoglobin concentration (RBC HC) histogram represents the distribution of red blood cells by cellular hemoglobin concentration. The histogram has a range of 0 g/dL to 50 g/dL.



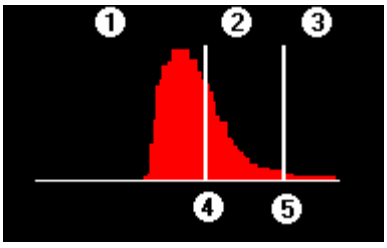
RBC HC histogram (normal sample)



1 Hypochromic region
2 Normochromic region
3 Hyperchromic region
4 28 g/dL marker
5 41 g/dL marker

Normal samples have a bell-curve shaped Hgb concentration distribution with a mean channel between 28 g/dL and 41 g/dL. The cell hemoglobin concentration mean (CHCM) and the hemoglobin distribution width (HDW) are obtained from this histogram. The CHCM is the mean of the RBC HC histogram. The HDW is the standard deviation of the RBC HC histogram. The CHCM calibration factor has been applied to the displayed data.

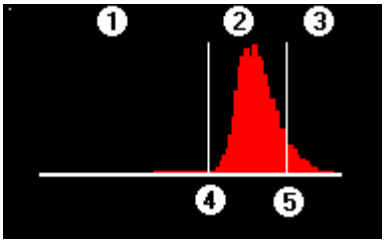
RBC HC histogram (hypochromic sample)



1 Hypochromic region
2 Normochromic region
3 Hyperchromic region
4 28 g/dL marker
5 41 g/dL marker

In samples with increased numbers of hypochromic RBCs, the histogram curve shifts to the left, indicating an increase in the percentage of the cells with hemoglobin concentrations less than 28 g/dL.

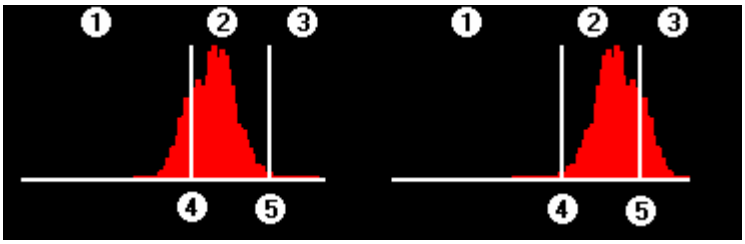
RBC HC histogram (hyperchromic sample)



1 Hypochromic region
2 Normochromic region
3 Hyperchromic region
4 28 g/dL marker
5 41 g/dL marker

In samples with increased numbers of hyperchromic RBCs, the histogram curve shifts to the right, indicating an increase in the percentage of the cells with hemoglobin concentrations greater than 41 g/dL.

RBC HC histogram (Hgb variance sample)



1 Hypochromic region

2 Normochromic region

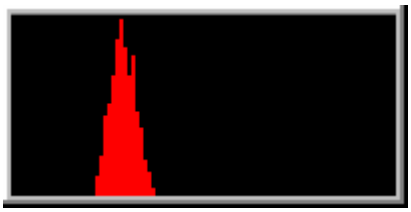
3 Hyperchromic region

4 28 g/dL marker

5 41 g/dL marker

HDW provides an indication of Hgb concentration variance, and the results are flagged if the HDW exceeds 3.4 g/dL. Note that two specimens with the same HDW value can have different degrees of hypochromia and hyperchromia.

RBC CH Histogram



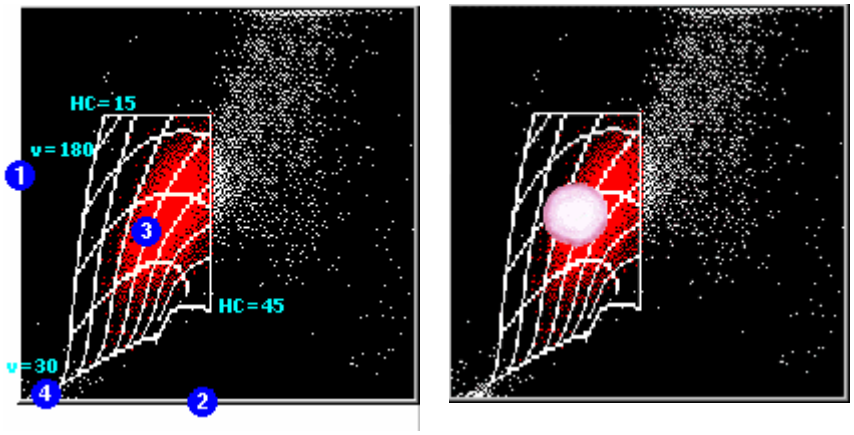
The RBC CH (cellular hemoglobin) histogram represents the distribution of red blood cells by the amount of hemoglobin present in each cell independent of cell volume.

The histogram has a range of 0 picograms to 100 picograms.

Cellular Hemoglobin Content (CH) is the mean of the RBC CH histogram. The cell hemoglobin distribution width (CHDW) is the standard deviation of the RBC CH histogram.

RBC Scatter Cytogram

The RBC Scatter cytogram is the graphical representation of two light-scatter measurements: the high-angle light scatter (5° to 15°) is plotted along the x axis, and the low-angle light scatter (2° to 3°) is plotted along the y axis.



1 Low-angle light scatter (2° to 3°)

2 High-angle light scatter (5° to 15°)

3 Mie map containing RBCs

4 Platelets detected in RBC method

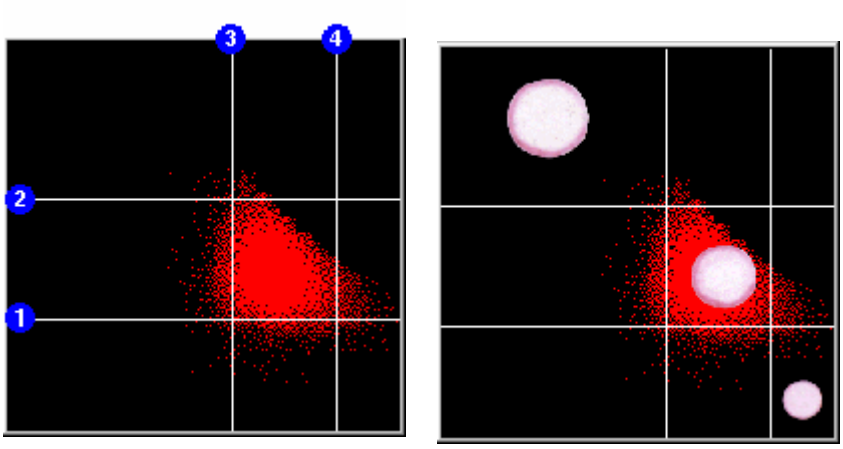
Using the Mie theory of light scattering for homogeneous spheres, the low-angle and high-angle light scatter signals for each cell are transformed into volume and hemoglobin concentration values.

The RBC map shows the relationship between the light-scatter measurements and the cell-by-cell characteristics of volume and hemoglobin concentration. The map grid encompasses RBC volumes between 30 fL and 180 fL and hemoglobin concentrations between 19 g/dL and 49 g/dL.

For a normal specimen, the RBC population appears in the center of the map. However, since this map is nonlinear, visually evaluating red cell morphology can be difficult. Use the V/HC cytogram, which provides a linear presentation of cell volume and hemoglobin concentration.

RBC Volume / Hemoglobin (V / HC) Cytogram

The Volume/Hemoglobin Concentration (V/HC) cytogram is a linear version of the RBC map that appears on the RBC cytogram. On the V/HC cytogram, hemoglobin concentration is plotted along the x axis and cell volume is plotted along the y axis. Only red blood cells appear on this cytogram.



1 60 fL volume marker

2 2120/2120i fL volume marker

3 28 g/dL HC marker

5 41 g/dL HC marker

Markers organize the cytogram into 9 distinct areas of red blood cell morphology.

On the x axis, hemoglobin concentration markers are set at 28 g/dL (3) and 41 g/dL (4).

Red blood cells with a hemoglobin concentration less than 28 g/dL are hypochromic, while cells with a hemoglobin concentration greater than 41 g/dL are hyperchromic.

On the y axis, RBC volume markers are set at 60 fL (1) and 2120/2120i fL (2).

Red blood cells with a volume less than 60 fL are microcytic, while cells with a volume greater than 2120/2120i fL are macrocytic.

RBC Matrix

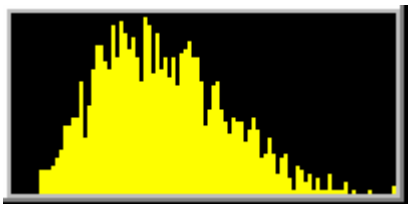
	HC < 28	HC = 28 - 41	HC > 41
V > 120	6 0.0 %	0 0.0 %	0 0.0 %
V = 60 - 120	12116 30.2 %	27558 68.8 %	5 0.0 %
V < 60	94 0.2 %	282 0.7 %	6 0.0 %

The RBC Matrix provides the cell counts and percentages for the nine regions of the RBC V/HC cytogram.

NOTE: Analysis of the RBC Volume and RBC HC histograms provides a quantitative analysis of the red blood cell populations. Additional, qualitative information concerning these red blood cell populations can be gained from simultaneous analysis of volume and hemoglobin concentration using the RBC V/HC cytogram.

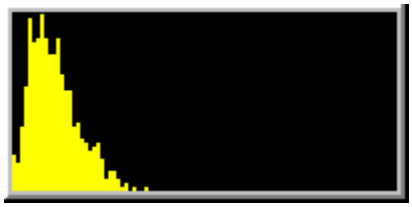
Since the histogram analysis uses calibration factors that are not applied to the RBC V/HC cytogram, there can be a discrepancy between the RBC matrix values and the corresponding %Micro, %Macro, %Hypo, and %Hyper values obtained from the histograms based on the value of the calibration factors. The closer the MCV and CHCM calibration factors are to 1.0, the smaller the discrepancies are.

Platelet X Histogram



The Platelet X histogram is a 100-channel display of the high-angle (5° to 15°), high-gain light scatter measurements that corresponds to the x axis on the PLT Scatter cytogram.

Platelet Y Histogram



The Platelet Y histogram is a 100-channel display of the low-angle (2° to 3°), high-gain light scatter measurements that corresponds to the y axis on the PLT Scatter cytogram.

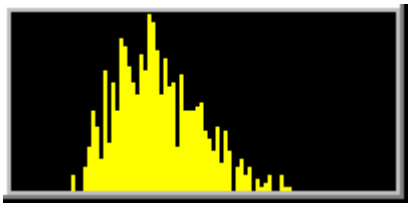
Platelet VOL Histogram



The Platelet VOL histogram of the two-dimensional PLT analysis shows the distribution of cells by volume. Volume data are obtained from the integrated analysis.

The histogram has a range of 0 fL to 60 fL. Large platelets with volumes up to 60 fL are included in the PLT count.

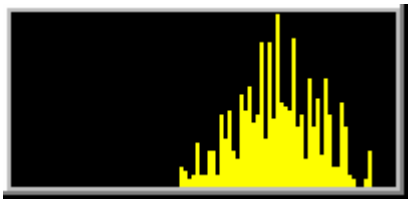
NOTE: Whenever the ratio of RBC fragments to platelets exceeds 0.25, the system uses the log normal fit calculation to determine the platelet count, and the log normal fit curve appears on the Platelet Volume histogram. Platelet PM Histogram



The Platelet PM histogram of the two-dimensional PLT analysis shows the distribution of platelets by the platelet dry mass (PM).

The histogram has a range of 0 pg to 5.0 pg.

Platelet PC Histogram

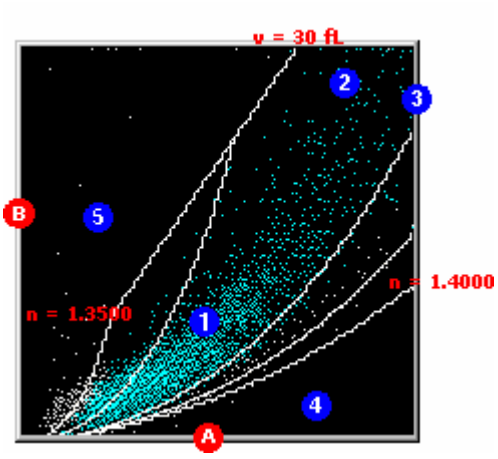


The Platelet PC histogram of the two-dimensional PLT analysis shows the distribution of platelets according to the refractive index (platelet component concentration [PC]).

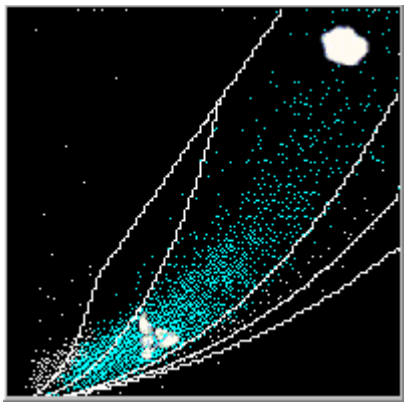
The histogram has a range of 0 pg to 5.0 pg

PLT Scatter Cytogram

The PLT Scatter cytogram is the graphical representation of two light-scatter measurements: the high-angle (5° to 15°), high-gain light scatter is plotted on the x axis (A), and the low-angle (2° to 3°), high-gain light scatter is plotted on the y axis (B).



1 Platelets
2 Large platelets
3 Red blood cells
4 RBC fragments
5 RBC ghosts



Using the Mie theory of light scattering for homogeneous spheres, the low-angle and high-angle light scatter signals for each cell are transformed into volume and refractive index (n) values.

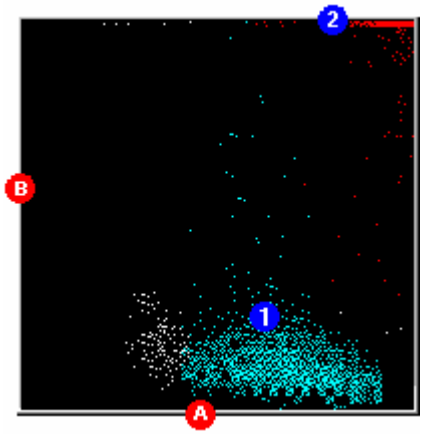
The PLT map shows the relationship between the light-scatter measurements and the cell-by-cell characteristics of volume and refractive index. The map grid encompasses volumes between 0 fL and 30 fL, and refractive index between 1.3500 and 1.4000.

The platelet count includes platelets (1) and large platelets (2).

RBC fragments (4) and RBC ghosts (5) are not included in the platelet count but are enumerated for flagging purposes.

Due to the high gain used in the platelet method, the RBCs appear in the saturation channels at the upper right corner of the cytogram.

PLT Volume / PC Cytogram



Displayed cells:

1. Platelets
2. Red blood cells

The Platelet Volume / Refractive Index (PC) cytogram is a 100 by 100 channel display.

x axis (A): refractive index (concentration of the platelet component [PC]) range: 0 g/dL to 40 g/dL

y axis (B): platelet volume range: 0 fL to 60 fL

Integrated Analysis

The 2-Dimensional platelet analysis (2D-PLT method) is based on the integrated analysis of red blood cell and platelet measurements. The PLT Scatter cytogram is formed by pairing light-scatter signals acquired at low angle - high gain and at high angle - high gain that are converted into volume and refractive index values. The PLT Scatter cytogram displays cells with volumes of 0 fL to 30 fL. Cell identification and counts for cells with volumes greater than 30 fL is done using the RBC Scatter cytogram.

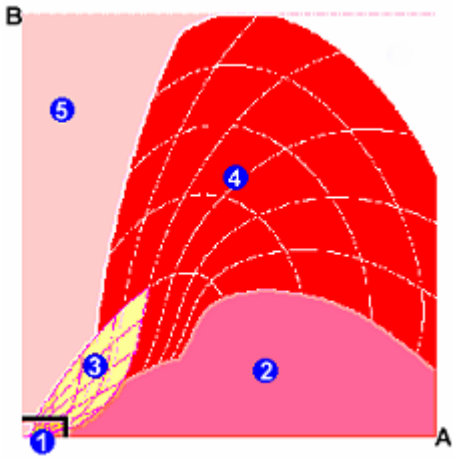
Integrated analysis is used todistinguish platelets, large platelets, red blood cells, RBC fragments, and RBC ghosts.

This example illustrates how large platelets are counted:

- Large platelets are identified on the PLT Scatter cytogram based on their refractive index values (1.35 to 1.40) and a volume greater than 20 fL.

- Large platelets are also identified on the RBC Scatter cytogram (area 3 below) based on their refractive index values (1.35 to 1.40) and a volume less than 60 fL.

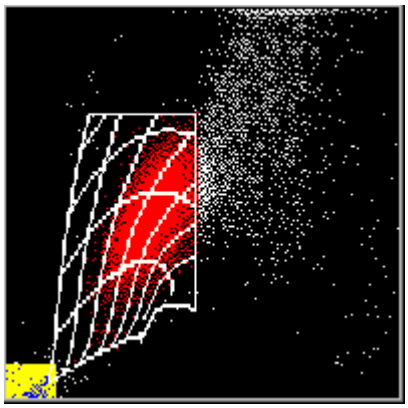
The Platelet VOL histogram contains platelets and large platelets with volumes up to 60 fL.



x axis (**A**) high-angle (5° to 15°) light scatter

y axis (**B**) low-angle (2° to 3°) light scatter

- Area covered by the PLT Scatter Cytogram
- RBC fragments
- Large platelets
- RBCs
- RBC ghosts



Calculating RBC Parameters

Reported Parameters

Parameter	Explanation
RBC	Number of Red Cells x RBC Cal Factor x Dilution Factor x Coincidence-correction Factor
MCV	Mean of RBC Volume histogram
RDW	100 x (SD of RBC Volume histogram ÷ MCV)
CHCM	Mean of RBC HC histogram
HDW	SD of RBC HC histogram

CH	Mean of RBC CH histogram
HCT	(RBC x MCV) ÷ 10
MCH	(HGB ÷ RBC) x 10
MCHC	(HGB ÷ [RBC x MCV]) x 1000

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
CHDW	SD of RBC CH histogram
RBC Flatness	$\sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$
RBC % Dead Time	100 x (Measured Dead Time ÷ Measured Sample Time)
RBC Coin Level	Number of coincidence events to be trimmed
RBC Coin Count	Coincidence Count in RBC Scatter cytogram
RBC R Count	Number of RBCs in RBC Scatter cytogram
RBC P Count	Number of platelets in RBC Scatter cytogram
RBC Valid Cells	Number of Valid Signals Obtained from Flowcell Events
#MICRO	Cell Count (30 fL to 60 fL) in RBC Volume histogram
%MACRO	$\mathbf{100 \times \frac{Cell\ Count\ in\ RBC\ Volume\ histogram > 120\ fL}{Total\ Cell\ Count\ in\ RBC\ Volume\ histogram}}$
%MICRO	$\mathbf{100 \times \frac{Cell\ Count\ in\ RBC\ Volume\ histogram < 60\ fL}{Total\ Cell\ Count\ in\ RBC\ Volume\ histogram}}$
%HYPER	$\mathbf{100 \times \frac{Cell\ Count\ in\ RBC\ HC\ histogram > 41g/dL}{Total\ Cell\ Count\ in\ RBC\ HC\ histogram}}$
%HYPO	$\mathbf{100 \times \frac{Cell\ Count\ in\ RBC\ HC\ histogram < 28g/dL}{Total\ Cell\ Count\ in\ RBC\ HC\ histogram}}$

%MICRO/ %HYPO RATIO	%MICRO ÷ %HYPO

Parameter Key

Dilution Factor
The dilution factor for the RBC channel is 83.33333E-6.

RBC
Red blood cell count

MCV
Mean Corpuscular Volume

RDW
Red Cell Volume Distribution Width

CHCM
Corpuscular Hemoglobin Concentration Mean

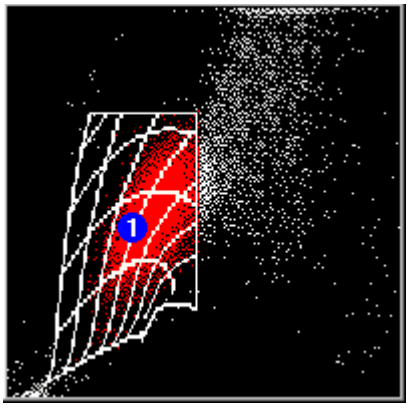
CH
Cellular Hemoglobin Content

HDW
Hemoglobin Concentration Distribution Width

HCT
Hematocrit

Number of red cells
(RBC R Count x RBC Valid Cells) ÷ (RBC R Count + RBC P Count)

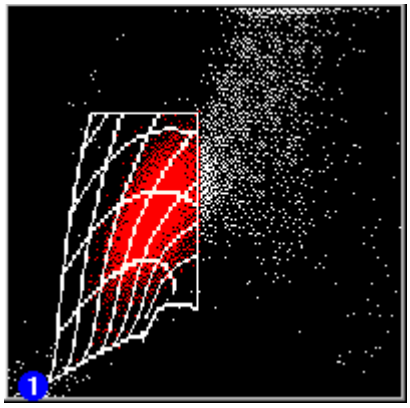
RBC R Count



Number of cells in the RBC area (1) of the RBC Scatter Cytogram.

RBC Valid Cells
The number of valid electronic pulse signals detected from flowcell events.

RBC P Count



Number of cells in the platelet area (1) of the RBC Scatter Cytogram.

CHDW
Cell Hemoglobin Distribution Width

RBC % Dead Time
Percent of analysis time when the channel is busy and cannot detect flowcell events

RBC Coin Level
RBC Coincidence Level

RBC Coin Count
RBC Coincidence Count

RBC R Count
Raw red blood cell count from the RBC method

RBC P Count
Raw platelet count from the RBC method

% MACRO
Percent of macrocytic red blood cells

% MICRO
Percent of microcytic red blood cells

MICRO
Number of microcytic red blood cells

% HYPER
Percent of hyperchromic red blood cells

% HYPO
Percent of hypochromic red blood cells

%Micro / %Hypo Ratio
This parameter is reported to be of use in differentiating two types of microcytic anemia.

Bibliography

D'Onofrio G., Zini G., Ricerca B. M., Mancini S., and Mango G.: Automated measurement of red blood cell microcytosis and hypochromia in iron deficiency and β-thalassemia trait. *Arch. Pathol. Lab. Med.* **116**:84 (1992)

Calculating Platelet Parameters

Reported Parameters

Parameter	Explanation
PLT	Corrected PLT Count x RBC Cal Factor x PLT Cal Factor x Dilution Factor
MPV	Mean of Platelet VOL histogram

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
Large PLT	Platelets with volumes greater than 20 fL
MPC	Mean of Platelet PC histogram
MPM	Mean of Platelet PM histogram
PCDW	SD of Platelet PC histogram
P Count - 2D	Raw cell count for platelets and large platelets from 2D-platelet analysis
PCT	(PLT x MPV) ÷ 10,000
PDW	100 x (SD of Platelet VOL histogram ÷ MPV)
PLT N	Mean of refractive index values for platelets only
PLT X	Mean of high-angle, high-gain values for platelets only
PLT Y	Mean of low-angle, high-gain values for platelets only
PMDW	SD of Platelet PM histogram
R Count - 2D	Raw cell count for RBCs, RBC ghosts, and RBC fragments from 2D-platelet analysis
RBC - 2D Count	Number of Red Cells-2D from 2D-platelet analysis x RBC Cal Factor x Dilution Factor x Coincidence-correction Factor

Parameter	Explanation
RBC Fragments	Count of RBC Fragments
RBC Ghosts	Count of RBC Ghosts

Parameter Key

Dilution Factor

The dilution factor for the PLT channel is 83.33333E-3.

PLT

Platelet count

MPV

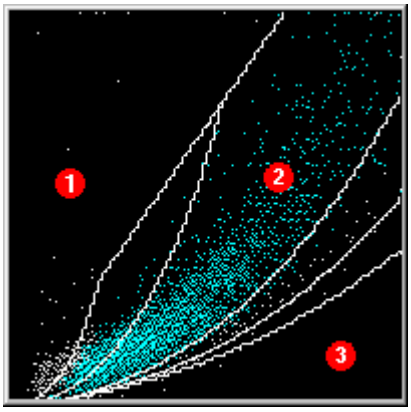
Mean Platelet Volume

Large PLT

The count of platelets with volumes greater than 20 fL is derived from the Platelet Volume histogram based on Integrated Analysis.
Large Platelet Count in the same units selected for PLT on the Unit Set Configuration window of the System Setup tab.

RBC Fragments

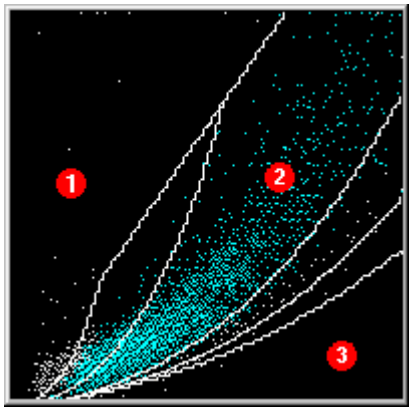
This count includes events in the RBC Fragment area of the PLT Scatter cytogram that have volumes less than 30fL and refractive indexes greater than 1.400.



1 RBC Ghost area
2 Platelet area
3 RBC Fragment area

The RBC Fragments Count is in the same units selected for RBC on the Unit Set Configuration window of the System Setup tab.

RBC Ghosts
This count includes events in the RBC Ghost area of the PLT Scatter cytogram that have refractive indexes lower than 1.350.



1 RBC Ghost area
2 Platelet area
3 RBC Fragment area

The RBC Ghosts Count is in the same units selected for RBC on the Unit Set Configuration window of the System Setup tab.

MPC
Mean Platelet Component Concentration

MPM
Mean Platelet Dry Mass

PCDW
Platelet Component Distribution Width

PDW
Platelet Volume Distribution Width

PMDW
Platelet Dry Mass Distribution Width

PCT
Platelet Crit

RBC Fractional Dead Time
The fraction of time that the channel is busy processing flowcell events. While the RBC/Plt channel is busy identifying a particular flowcell event, it is unable to process any additional events that might occur. By measuring this "dead time", the analyzer can compensate for the missed events.

Note that the RBC / Plt channel dead time has RBC and platelet components.

Corrected Platelet Count
The corrected platelet count is calculated using the P Count-2D , R Count-2D RBC Fractional Dead Time , and RBC Valid Cells.

P Count-2D
The number of cells identified as platelets and large platelets. The platelets are obtained from the PLT Scatter cytogram, and the large platelets are obtained from the integrated analysis.

R Count-2D
The count of RBCs, RBC ghosts, and RBC fragments that is obtained from the integrated analysis.

Number of red cells-2D
(R Count-2D x RBC Valid Cells) ÷ (R Count-2D + P Count-2D)

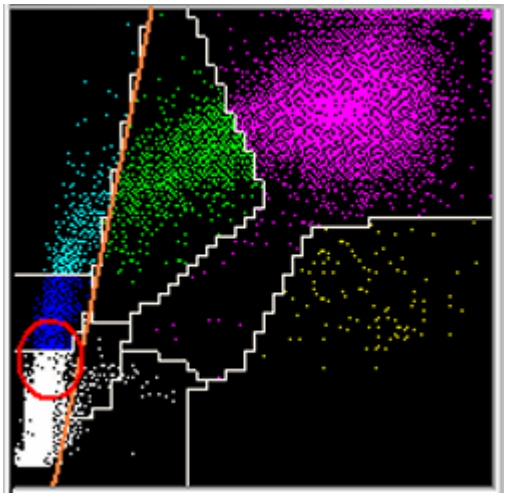
NRBC Analysis

NRBC Method Description

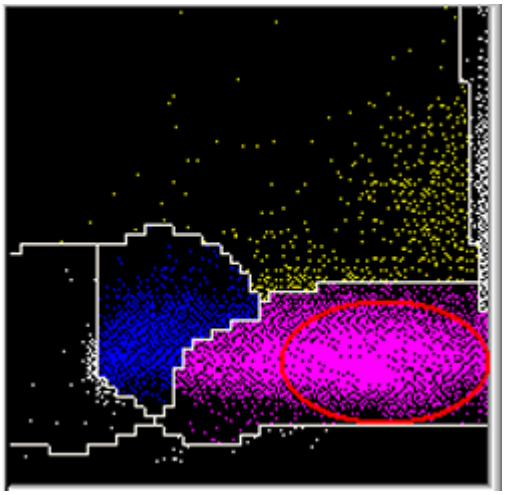
The ADVIA 22120/2120i/22120/2120ii NRBC analysis method reports NRBC counts for whole blood samples with either 200 or more nRBC/µL or with at least 2% nRBCs with a WBC count of at least 3000/µL.

The method reports both an absolute nRBC count (10^9/L) and a percentage count (#NRBC/100 WBC). It also corrects the WBC count for nRBC, recalculates the WBC differential and %MN and %PMN. The uncorrected counts are also available and are designated by a lower case “u”.

NOTE: NRBC results are available only for samples processed in CBC/Diff or CBC/Diff / Retic mode.



PEROX Cytogram with location of nRBC and Unstained line



BASO Cytogram with location of nRBC

The method identifies nRBCs by nuclear size in the Peroxidase channel, and by nuclear density in the Basophil/Lobularity channel.

In the unstained region of the Peroxidase Channel cytogram, nRBC nuclei are located between the noise and lymphocytes. They often form distinct populations, which are analyzed to produce counts.

In the Basophil/Lobularity channel cytogram, nRBC nuclei are located in the polymorphonuclear region, rather than in the mononuclear region, because they are denser than lymphocyte or monocyte nuclei. Since they are not the nuclei of polymorphonuclear cells, the difference between the number of nuclei in this region and the sum of neutrophils and eosinophils in the Peroxidase Channel may equal the NRBC count. This difference is called the "Barox" (**Ba**so / Pe**rox**) count.

The method generates four NRBC counts for every sample.

Histo count
The NRBC count from analysis of the unstained region of the Peroxidase Channel Y-axis histogram

Gaussian count
The NRBC count from making a gaussian fit to the nRBC section of the unstained region of the Peroxidase Channel Y-axis

Residual count
The NRBC count from subtracting the noise and lymphocytes from the unstained region of the Peroxidase Channel Y-axis histogram

Barox count
The NRBC count from the equation #nRBC = #PMNs - #NEUTs - #EOS

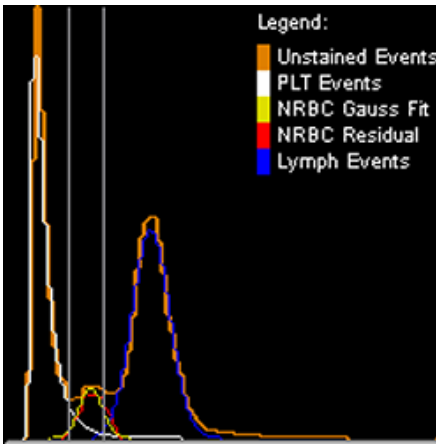
The system then uses selection rules to determine which, if any, of the NRBC counts to report.

NRBC Enumeration Histogram

The NRBC Enumeration Histogram is a 100-channel display of the light scatter measurements and corresponds to the unstained region of the Peroxidase Channel Y-axis histogram. This display of the NRBC Analysis shows overlays of:

- Unstained Events
- PLT Events
- NRBC Gauss Fit
- NRBC Residual
- Lymph Events

The histogram also includes goalposts, which designate the Histo and Residual counts. These goalposts appear only when the Histo or Residual count is the selected NRBC count.



NRBC Enumeration Histogram

Calculating Reported NRBC Parameters

The system corrects the reported WBC count when nRBCs are detected.

Histo, Residual, or Gaussian Count

$$\frac{WBCu}{1+\frac{\%NRBC}{100}}$$

Barox Count

$$\left(WBCP+\frac{\%Neut+\%Eos}{100}\right)+\left(WBCB+\frac{\%MN+\%Baso}{100}\right)$$

Reticulocyte Method

Cytochemical Reactions

The reticulocyte cytochemical reactions consist of two steps:

Step 1 RBCs and platelets are isovolumetrically sphered using ADVIA 2120/2120i autoRETIC reagent.

Step 2 Reticulocytes are differentially stained based on their RNA content.

ADVIA 2120/2120i autoRETIC

NOTE: For more detailed information on the contents of ADVIA 2120/2120i autoRETIC reagent, please see Chapter 8.

The ADVIA 2120/2120i autoRETIC reagent contains a zwitterionic detergent (surfactant) that isovolumetrically spheres the red cells. It also contains a cationic dye, Oxazine 750, that stains cells according to their RNA content.

Measurement

A constant volume of the cell suspension from the retic reaction chamber passes through the flowcell where the low-angle light scatter (2° to 3°), the high-angle light scatter (5° to 15°), and the absorption signatures for each cell are measured. ADVIA 2120/2120i SHEATH/RINSE encases the sample stream as the two fluids pass through the flowcell.

The low-angle and high-angle light scatter signatures are proportional to cell size and hemoglobin concentration. Light absorption is proportional to RNA content. The stained reticulocytes will absorb more light than the mature RBCs.

The two light-scatter signals and the absorption signal are detected, electronically amplified, and split into six signals.

One of the low-angle light scatter signals is amplified 28 times.

One of the high-angle light scatter signals is amplified 12 times.

One of the absorption signals is amplified 33 times.

After processing, this information is available:

RETIC Rate histogram displays the arrival rate of cells in the retic channel.

RETIC Abs Flatness histogram displays the mean absorption at 200-millisecond intervals.

RETIC Abs histogram displays the overlaid distribution of mature RBCs and reticulocytes by their absorption values.

RETIC Volume histogram shows the overlaid distribution of mature RBCs and reticulocytes by their cell volume independent of hemoglobin concentration.

RETIC HC histogram shows the overlaid distribution of mature RBCs and reticulocytes by hemoglobin concentration independent of cell volume.

RETIC CH histogram shows the overlaid distribution of mature RBCs and reticulocytes by hemoglobin content (cellular hemoglobin).

RETIC Scatter Abs cytogram is formed from the paired high-angle, low-gain light scatter and the high-gain absorption data. Sample-specific thresholds separate the cell populations.

RETIC Scatter cytogram is formed by plotting the high-angle, low-gain light scatter along the x axis, and the low-angle, low-gain light scatter on the y axis.

RETIC V / HC cytogram provides a representation of the cell volume and hemoglobin concentration.

Reticulocyte Method Nomenclature

Mature (m), Reticulocytes (r), Gated (g)

The lowercase letters m, r, and g are commonly used in the reticulocyte parameters to identify a specific population.

For example: MCVm, MCVr, and MCVg refer to the mean cell volume for the mature RBC, reticulocyte, and gated populations, respectively.

"Gated" refers to the total population of RBCs containing both mature RBCs and reticulocytes.

Negative versus Positive Cell Populations

Since reticulocytes have RNA and stain with ADVIA 2120/2120i autoRETIC reagent, they are the positive cell population. Mature RBCs do not stain, and they are the negative cell population.

Immature Reticulocyte Fraction

Immature Reticulocyte Fraction (IRF) is a descriptive term recommended in NCCLS Document H44-A "Methods for Reticulocyte Counting: Flow Cytometry and Supravital Dyes; Approved Guideline" to replace a previously-used term, Reticulocyte Maturation Index (RMI).

Two IRF parameters are calculated: IRF-H and IRF-H+M.

RETIC Rate Histogram



The RETIC Rate histogram shows the uniformity of the cell-counting rate.

The rate histogram data consists of 50 points, one taken every 200 milliseconds. Each point represents the number of valid cells counted during the last 200 milliseconds.

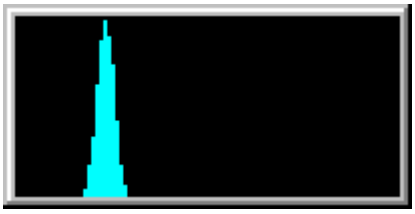
RETIC Abs Flatness Histogram



The RETIC Abs Flatness histogram data consists of 50 points, one taken every 200 milliseconds. Each point represents the mean absorption for the last 200 milliseconds.

This histogram provides a visual indication of the absorption signal "flatness" to monitor the laser performance. Laser oscillation can cause an erratic presentation.

RETIC Abs Histogram

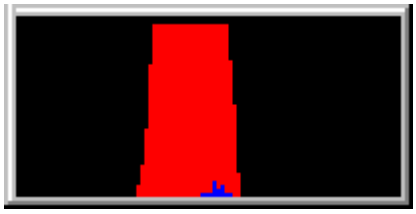


The RETIC Abs histogram represents the distribution of mature RBCs and reticulocytes according to their corrected absorption values.

Absorption correction compensates for drift in the absorption channel optics and for scattered light that is not collected.

RETIC Volume Histogram

The RETIC Volume histogram represents the overlaid distributions of mature RBCs and reticulocytes by cell size only. The histogram has a range from 0 fL to 200 fL. The displayed data includes the MCVg calibration factor.



Mature RBC population (red)

Reticulocyte population (blue)

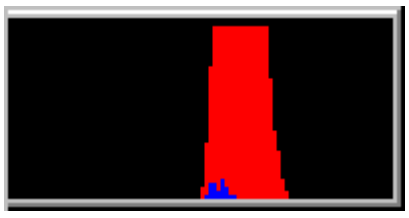
RETIC Volume Histogram Parameters

%MACROr	Percentage of reticulocyte population with cell volumes greater than 120 fL
%MACROm	Percentage of mature RBC population with cell volumes greater than 120 fL
%MACROg	Percentage of gated cell population with cell volumes greater than 120 fL
%MICROr	Percentage of reticulocyte population with cell volumes less than 60 fL

%MICROm	Percentage of mature RBC population with cell volumes less than 60 fL
%MICROg	Percentage of gated cell population with cell volumes less than 60 fL
MCVr	Mean Corpuscular Volume is the mean of the RETIC Volume histogram for the reticulocyte population.
MCVm	Mean Corpuscular Volume is the mean of the RETIC Volume histogram for the mature RBC population.
MVCg	Mean Corpuscular Volume is the mean of the RETIC Volume histogram for the gated cells.
MCV Delta	MCVr - MCVm
RDWr	Red cell Distribution Width is the coefficient of variation (CV) of the RETIC Volume histogram (channels 15 to 99) for the reticulocyte population.
RDWm	Red cell Distribution Width is the coefficient of variation (CV) of the RETIC Volume histogram (channels 15 to 99) for the mature RBC population.
RDWg	Red cell Distribution Width is the coefficient of variation (CV) of the RETIC Volume histogram (channels 15 to 99) for the gated cells.
RDW Delta	RDWr - RDWm

RETIC HC Histogram

The RETIC hemoglobin concentration (RETIC HC) histogram represents the overlaid distributions of mature RBCs and reticulocytes by cellular hemoglobin concentration only. The histogram has a range from 0 g/dL to 50 g/dL. The displayed data includes the CHCMg calibration factor.



Mature RBC population (red)

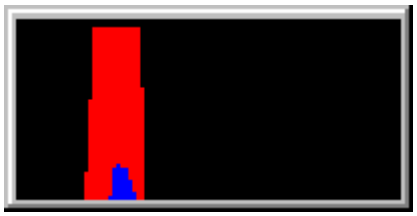
Reticulocyte population (blue)

RETIC HC Histogram Parameters

%HYPERr	Percentage of reticulocyte population with cellular hemoglobin concentration greater than 41 g/dL
%HYPERm	Percentage of mature RBC population with cellular hemoglobin concentration greater than 41 g/dL
%HYPERg	Percentage of gated cell population with cellular hemoglobin concentration greater than 41 g/dL
%HYPOr	Percentage of reticulocyte population with cellular hemoglobin concentration less than 28 g/dL
%HYPOm	Percentage of mature RBC population with cellular hemoglobin concentration less than 28 g/dL
%HYPOg	Percentage of gated cell population with cellular hemoglobin concentration less than 28 g/dL
CHCMr	Cellular Hemoglobin Concentration Mean is the mean of the RETIC HC histogram for the reticulocyte population.
CHCMm	Cellular Hemoglobin Concentration Mean is the mean of the RETIC HC histogram for the mature RBC population.
CHCMg	Cellular Hemoglobin Concentration Mean is the mean of the RETIC HC histogram for the gated cells.
CHCM Delta	CHCMr - CHCMm
HDWr	Hemoglobin Distribution Width is the standard deviation (SD) of the RETIC HC histogram for the reticulocyte population.
HDWm	Hemoglobin Distribution Width is the standard deviation (SD) of the RETIC HC histogram for the mature RBC population.
HDWg	Hemoglobin Distribution Width is the standard deviation (SD) of the RETIC HC histogram for the gated cells.
HDW Delta	HDWr - HDWm

RETIC CH Histogram

The RETIC cellular hemoglobin (RETIC CH) histogram represents the overlaid distributions of mature RBCs and reticulocytes by the actual weight or mass of hemoglobin present in each cell. The histogram has a range from 0 pg to 100 pg.



Mature RBC population (red)

Reticulocyte population (blue)

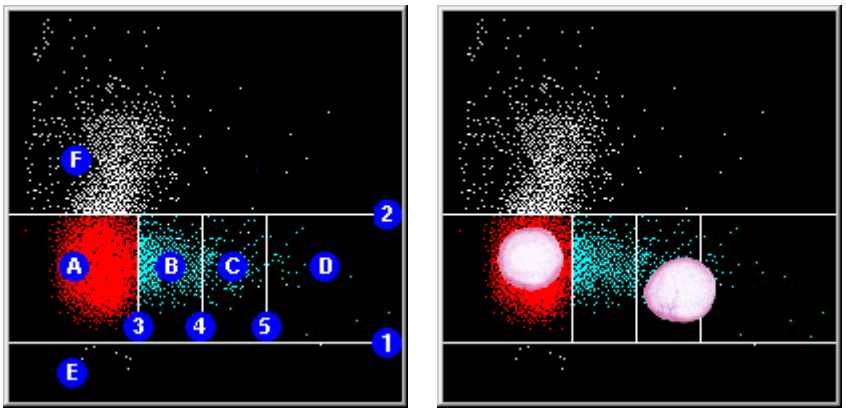
RETIC CH Histogram Parameters

%HIGH CHr	Percentage of reticulocyte population with cellular hemoglobin greater than 31 pg
%HIGH CHm	Percentage of mature RBC population with cellular hemoglobin greater than 31 pg
%HIGH CHg	Percentage of gated cell population with cellular hemoglobin greater than 31 pg
%LOW CHr	Percentage of reticulocyte population with cellular hemoglobin less than 27 pg
%LOW CHm	Percentage of mature RBC population with cellular hemoglobin less than 27 pg
%LOW CHg	Percentage of gated cell population with cellular hemoglobin less than 27 pg
CHr	Cellular Hemoglobin Mean is the mean of the RETIC CH histogram for the reticulocyte population.
CHm	Cellular Hemoglobin Mean is the mean of the RETIC CH histogram for the mature RBC population.
CHg	Cellular Hemoglobin Mean is the mean of the RETIC CH histogram for the gated cells.
CH Delta	CHr - CHm
CHDWr	Cellular Hemoglobin Distribution Width is the standard deviation (SD) of the RETIC CH histogram for the reticulocyte population.
CHDWm	Cellular Hemoglobin Distribution Width is the standard deviation (SD) of the RETIC CH histogram for the mature RBC population.

CHDWg	Cellular Hemoglobin Distribution Width is the standard deviation (SD) of the RETIC CH histogram for the gated cells.
CHDW Delta	CHDWr - CHDWm

RETIC Scatter Abs Cytogram

The RETIC Scatter ABS cytogram is the graphical representation of the absorption and light-scatter measurements: the high-gain, absorption (cell maturation) is plotted along the x axis and the high-angle, low-gain light scatter (cell size) is plotted along the y axis.



1 RTC Platelet threshold
2 RTC Coincidence threshold
3 RTC threshold
4 Low/Medium RTC threshold
5 Medium/High RTC threshold
A Mature RBCs
B Low absorption retics
C Medium absorption retics
D High absorption retics
E Platelets
F Coincidence events

The two thresholds on the y axis (1)(2) are set as follows:

1. The analyzer scans for the scatter mode between channels 10 and 99 on the y axis.
2. The mean channel and standard deviation (SD) are calculated.
3. The RTC Platelet threshold (1) is set at the mean channel minus 3.5 SD to separate the platelets from the mature RBCs and reticulocytes.
4. The RTC Coincidence threshold (2) is set at the mean channel plus 3.5 SD to separate the coincident cells from the mature RBCs and reticulocytes.

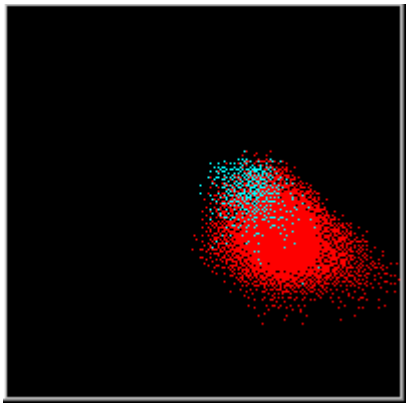
The RTC threshold (3) on the x axis is set as follows:

1. The analyzer scans for the absorption mode between channels 2 and 25 on the x axis.
2. The standard deviation (SD) of the six channels on either side of the mode is calculated.
3. The RTC threshold is set 3.2 SD from the mode channel to separate the mature RBCs from the reticulocytes.

Two additional thresholds (4)(5) are set on the x axis to separate the reticulocyte population by their stages of maturation. The youngest reticulocytes have the highest amounts of RNA (absorption), and appear further out on the x axis.

1. The RTC threshold channel is subtracted from 75, and the resulting difference is divided by three.
2. The Low/Medium RTC threshold (4) is set to the RTC threshold channel plus the value calculated in step 1.
3. The Medium/High RTC threshold (5) is set to the Low/Medium RTC threshold channel plus the value calculated in step 1.

RETIC V / HC Cytogram

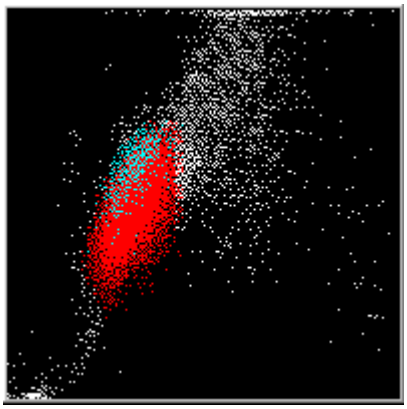


On the V/HC cytogram, hemoglobin concentration is plotted along the x axis, and cell volume is plotted along the y axis.

Cells identified as mature RBCs are red; while cells identified as reticulocytes are cyan.

RETIC Scatter Cytogram

The RETIC Scatter cytogram is the graphic representation of two light-scatter measurements: the high-angle, low-gain light scatter is plotted along the x axis, and the low-angle, low-gain light scatter is plotted along the y axis. Cells identified as mature RBCs are colored red; while cells identified as reticulocytes are colored cyan.



Using the Mie theory of scattering for homogeneous spheres , the low-angle and high-angle light scatter signals for each cell are transformed into volume and hemoglobin concentration values. RBCs have cell volumes between 30 fL and 180 fL, and hemoglobin concentrations between 19 g/dL and 49 g/dL.

Bibliography

Tycko DH, Metz MH, Epstein EA, Grinbaum: Flow-cytometric light scattering measurement of red blood cell volume and hemoglobin concentration. *Applied Optics* **24(9)**:1355-1365 (1985)

Calculating Retic Parameters

Reported Parameters

Parameter	Explanation
#Retic	RBC x (%Retic ÷ 100) x 1000
%Retic	100 x (RETIC Count ÷ #RTC Gated Cells) x % RETIC Cal Factor
CHr	Mean of the RETIC CH histogram for the reticulocyte population

System Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
RTC RBC	RBC Count
RTC Flatness	$\sqrt{\frac{\text{Sum of the Squared Differences}}{9 \times \text{Mean Cell Counting Rate}}}$
RTC % Dead Time	100 x (Measured Dead Time ÷ Measured Sample Time)

Parameter	Explanation
RTC % Noise	100 x (Outlier Cells ÷ #RTC Cells Analyzed)
Mean Absorption	Mean of the RETIC Abs histogram for the reticulocyte population
ABS Low Cell Count	Counts in x axis channels 1 to 3 of the RETIC Scatter Abs cytogram
ABS Mode	Mode channel of the Absorption population
RTC Valid Cells	Number of Valid Signals Obtained from Flowcell Events

Additional Parameters

The following parameters are for research or laboratory use only and are not for patient reporting:

Parameter	Explanation
CHCMr	Mean of the Retic HC histogram for the reticulocyte population
MCVm	Mean of the RETIC Volume histogram for the mature population
MCVr	Mean of the RETIC Volume histogram for the reticulocyte population
#Neg RBC	Number of mature RBCs
%Neg RBC	100 x (#Neg RBC ÷ #RTC Gated Cells)
Retic Count	Number of reticulocyte events
#LRetic	Number of low absorption reticulocytes
%LRetic	100 x (#LRetic ÷ RETIC Count)
#MRetic	Number of medium absorption reticulocytes
%MRetic	100 x (#MRetic ÷ RETIC Count)
#HRetic	Number of high absorption reticulocytes
%HRetic	100 x (#HRetic ÷ RETIC Count)
IRF-H	100 x (#HRetic ÷ RETIC Count)

Parameter	Explanation
IRF-M+H	100 x ([#HRetic + #MRetic] ÷ RETIC Count)
RTC Mean X	Mean x channel of the RETIC Scatter cytogram
RTC Mean Y	Mean y channel of the RETIC Scatter cytogram
#RTC Cells Acquired	Number of Valid Signals Obtained
#RTC Cells Analyzed	Cells on RTC Scatter cytogram with nonzero volume and hemoglobin values, and are not in channel 99
#RTC Gated Cells	#Neg RBC + Retic Count within threshold limits
Slope Negative Cells	Slope of the negative (mature RBC) population relative to y axis of the RETIC Scatter ABS cytogram

Parameter Key

#RETIC
Absolute number of reticulocytes

%RETIC
Percent of reticulocytes

CHCMr
Reticulocyte Cellular Hemoglobin Concentration Mean

CHr
Reticulocyte Cellular Hemoglobin Content

MCVm
Mean Cell Volume of mature population

MCVr
Mean Cell Volume of reticulocyte population

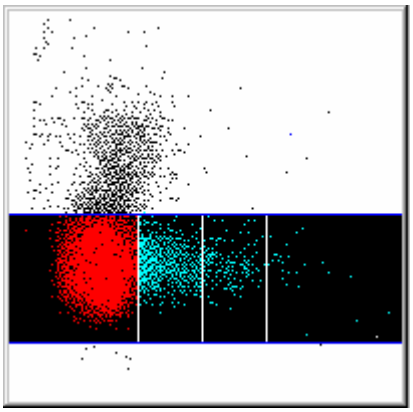
RBC
The system always uses the RBC count from the RBC / Platelet method, even when a sample has been run with a retic only selectivity.

RTC RBC
Red blood cell count from the Reticulocyte method. The RTC RBC count is calculated in the same manner as the RBC count from the RBC / Platelet Method.

RTC % Dead Time
Percent of analysis time when the channel is busy and cannot detect flowcell events

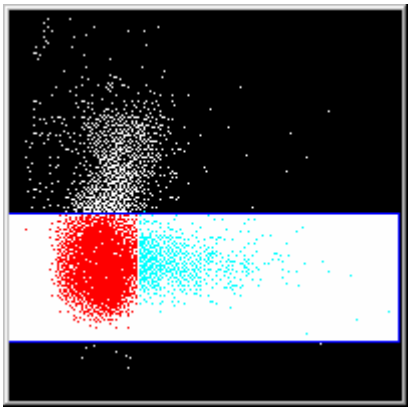
RTC % Noise
Percent of events from the outlier areas

Outlier Cells



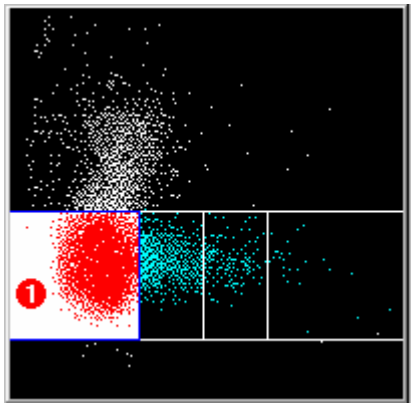
The outlier cell count includes cells with high-scatter values less than the RTC Platelet threshold, and cells with high-scatter values greater than the RTC Coincidence threshold.

RTC Gated Cells



The number of cells between the RTC platelet and RTC coincidence thresholds in the Retic Scatter Abs cytogram excluding channel 99.

Neg RBC

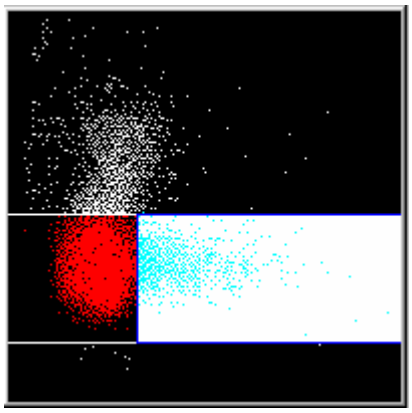


The number of cells in the mature RBC area (1) of the Retic Scatter Abs cytogram.

Neg RBC
Count of mature red blood cells

% Neg RBC
Percent of mature red blood cells

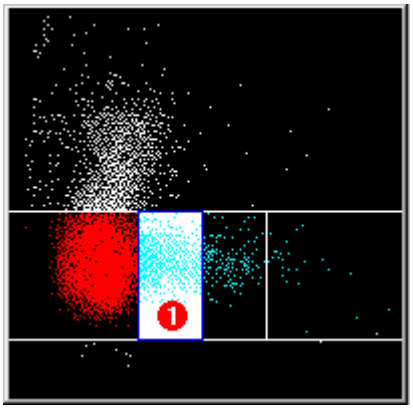
Number of Reticulocytes in the gated population



The total number of cells in the three reticulocyte areas of the Retic Scatter Abs cytogram.

Retic Count
Count of reticulocytes in the gated population

Number of Low Absorption Reticulocytes

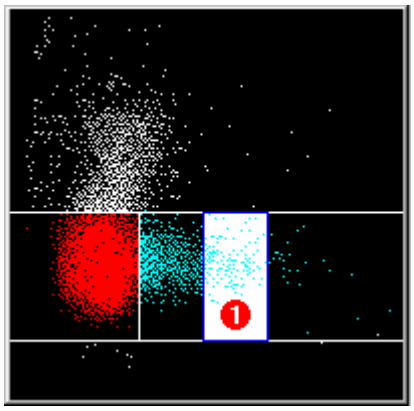


The number of gated cells (1) between the RTC and Low/Medium RTC thresholds of the Retic Scatter Abs cytogram.

#LRetic
Count of low absorption reticulocytes

%LRetic
Percent of low absorption reticulocytes

Number of Medium Absorption Reticulocytes

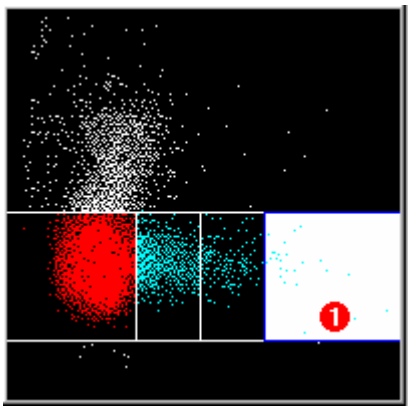


The number of gated cells (1) between the Low/Medium RTC and Medium/High RTC thresholds of the Retic Scatter Abs cytogram.

#MRetic
Count of medium absorption reticulocytes

%MRetic
Percent of medium absorption reticulocytes

Number of High Absorption Reticulocytes



The number of gated cells (1) to the right of the Medium/High RTC threshold of the Retic Scatter Abs cytogram.

#HRetic
Count of high absorption reticulocytes

%HRetic
Percent of high absorption reticulocytes

Regulatory Information

METHODS INTRODUCTION 4

Overview 4
Statement of Content 4
Sample Collection and Preparation 4
Calibrator and Control Products 5
Ancillary Reagents 8
Operation 8
Calculation of Results 9
Interpretation of Results 9
Waste Disposal Requirements 10
Waste Analysis 10
System Method Information 13
System Method Information: Intended Use 14
System Method Information: Principles of the Procedure 14
System Method Information: Reagents 14
System Method Information: Storage and Stability 15
System Method Information: Sample Handling 15
System Method Information: Materials Required but not Provided 15
System Method Information: Procedure 15
System Method Information: Quality Control 15
System Method Information: Gain Adjustment 15
System Method Information: Calibration 16
System Method Information: Results 16
System Method Information: Limitations of the Procedure 16
System Method Information: Expected Values 17
System Method Information: Performance Characteristics 17

CLSI DOCUMENT M29-A3 AND SIEMENS METHOD TOPICS CROSS REFERENCE 18

CBC METHOD 21

Intended Use 21
Principles of the Procedure 21
Hemoglobin Concentration 22
Reagents 23
Storage and Stability 26
Gain Adjustment 26
Calibration 26
Sample Handling 27
Materials Required but not Provided 28
Procedure 28
Quality Control 28
Results 28
Limitations of the Procedure 29
Expected Values 29
Performance Characteristics: Imprecision 30
Performance Characteristics: Correlation Data 30
Performance Characteristics: Carryover 31
Performance Characteristics: Analytical Range 32

CSF METHOD 33

INTENDED USE 33
PRINCIPLES OF THE PROCEDURE 33
REAGENT 34
STORAGE AND STABILITY 35
GAIN ADJUSTMENT 35
CALIBRATION 35
SAMPLE HANDLING 35
MATERIALS REQUIRED BUT NOT PROVIDED 36
PROCEDURE FOR RUNNING CSF SAMPLES 36
QUALITY CONTROL 38
RESULTS 39
LIMITATIONS OF THE PROCEDURE 39
INTERFERING SUBSTANCES 40
EXPECTED VALUES 40
PERFORMANCE CHARACTERISTICS: PRECISION 41
PERFORMANCE CHARACTERISTICS: ACCURACY 42
CSF RBC COUNT 42
PERFORMANCE CHARACTERISTICS: CARRYOVER 43
PERFORMANCE CHARACTERISTICS: ANALYTICAL RANGE 43

WBC DIFF METHOD 45

INTENDED USE 45
PRINCIPLES OF THE PROCEDURE 45
REAGENTS 47
STORAGE AND STABILITY 49
GAIN ADJUSTMENT 49
CALIBRATION 49
SAMPLE HANDLING 50
MATERIALS REQUIRED BUT NOT PROVIDED 50
PROCEDURE 51
QUALITY CONTROL 51
RESULTS 51
LIMITATIONS OF THE PROCEDURE 51
EXPECTED VALUES 52
PERFORMANCE CHARACTERISTICS: IMPRECISION 52
PERFORMANCE CHARACTERISTICS: CORRELATION DATA 53

RETICULOCYTE METHOD 54

INTENDED USE 54
PRINCIPLES OF THE PROCEDURE 54
REAGENTS 55
STORAGE AND STABILITY 56
GAIN ADJUSTMENT 57
CALIBRATION 57
SAMPLE HANDLING 58
MATERIALS REQUIRED BUT NOT PROVIDED 58
PROCEDURE 58
QUALITY CONTROL 59
RESULTS 60
LIMITATIONS OF THE PROCEDURE 60
EXPECTED VALUES 60
PERFORMANCE CHARACTERISTICS: IMPRECISION 61

PERFORMANCE CHARACTERISTICS: CORRELATION DATA 61
PERFORMANCE CHARACTERISTICS: CARRYOVER 61
PERFORMANCE CHARACTERISTICS: ANALYTICAL RANGE 62

METHOD DATA SUMMARY 63

CBC METHOD DATA 63
WBC DIFF METHOD DATA 64
RETIC METHOD DATA 65

Methods Introduction

Overview

The Methods Introduction describes the types of information contained in the ADVIA 2120/2120i Hematology System testing methods.

NOTE: Unless otherwise stated, the performance data for the methods were obtained using ADVIA 2120/2120i instruments, software, reagents, standards, and controls designed for or intended for use on the ADVIA 2120/2120i Hematology System.

Statement of Content

The Introduction contains information on ancillary reagents, controls, and calibrators for the ADVIA 2120/2120i Hematology System.

The procedures necessary for the preparation, use, and storage of the ADVIA 2120/2120i Hematology System method reagents are provided in the applicable method topics.

Sample Collection and Preparation

BIOHAZARD WARNING



All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

Refer to the Information Bulletin titled "Sample Handling Guidelines" (Publication No. TN9-5729-31).

Collect samples in a blood collection tube or microsample blood collection device that contains EDTA as the anticoagulant.

Refrigerate blood samples at 2°C to 8°C if they will not be analyzed within 8 hours of phlebotomy.

Do not assay cold specimens!
Allow the specimen to equilibrate to room temperature before mixing. *Do not* warm specimen by placing it into a 37°C water bath or incubator.

CAUTION: If the whole blood specimen is brought to room temperature quickly, there is a strong tendency for the platelets to clump upon mixing.

Do not use previously frozen whole blood samples. Freezing the blood can disrupt the cellular structure, thus resulting in aberrant cell counts.

Unless otherwise stated, no special treatment of the whole blood specimen is required. However, samples must be collected in the specified collection tube and gently, but thoroughly mixed at the time of collection and again before sampling.

Calibrator and Control Products

CAUTION! POTENTIAL BIOHAZARD

Contains human source material. While each human serum or plasma donor unit used in the manufacture of this product was tested by FDA-approved methods and found nonreactive for hepatitis B surface antigen (HBsAg), antibody to hepatitis C (HCV), and antibody to HIV-1/2, all products manufactured using human source material should be handled as potentially infectious. Because no test method can offer complete assurance that hepatitis B or C viruses, HIV, or other infectious agents are absent, these products should be handled according to established good laboratory practices.

Siemens supplies control and calibrator products for use with the ADVIA 2120/2120i Hematology System.

Refer to the current Price List, and the product package insert for additional information.

ADVIA 120 TESTpoint 3-in 1 Hematology Control Abnormal 1

REF	Product Number	Symbol	Contents	Amount (mL)
09459683	T03-4417-54	CONTROL ABN 1	Hematology Control Abnormal 1	4 x 4.0 mL
-	T03-4417-01	CONTROL ABN 1	Hematology Control Abnormal 1	4.0 mL

ADVIA 120 TEST Point 3-in-1Hematology Control Abnormal 2

REF	Product Number	Symbol	Contents	Amount (mL)
03410380	T03-4418-54	CONTROL ABN 2	Hematology Control Abnormal 2	4 x 4.0 mL

REF	Product Number	Symbol	Contents	Amount (mL)
-	T03-4418-01	CONTROL ABN 2	Hematology Control Abnormal 2	4.0 mL

ADVIA 120 TEST Point 3-in-1 Hematology Control Normal

REF	Product Number	Symbol	Contents	Amount (mL)
01964346	T03-4416-54	CONTROL NORM	Hematology Control Normal	4 x 4.0 mL
-	T03-4416-01	CONTROL NORM	Hematology Control Normal	4.0 mL

ADVIA 120 TESTpoint Hematology Control High

REF	Product Number	Symbol	Contents	Amount (mL)
08822644	T03-3688-54	CONTROL HIGH	Hematology Control High	4 x 4.0 mL
-	T03-3688-01	CONTROL HIGH	Hematology Control High	4.0 mL

ADVIA 120 TESTpoint Hematology Control Low

REF	Product Number	Symbol	Contents	Amount (mL)
00848547	T03-3686-54	CONTROL LOW	Hematology Control Low	4 x 4.0 mL
-	T03-3686-01	CONTROL LOW	Hematology Control Low	4.0 mL

ADVIA 120 TESTpoint Hematology Control Normal

REF	Product Number	Symbol	Contents	Amount (mL)
05147873	T03-3687-54	CONTROL NORM	Hematology Control Normal	4 x 4.0 mL
-	T03-3687-01	CONTROL NORM	Hematology Control Normal	4.0 mL

ADVIA 120 SETpoint Hematology Calibrator

REF	Product Number	Symbol	Contents	Amount (mL)
09170071	T03-3685-52	CAL	Hematology Calibrator	2 x 6.1 mL

REF	Product Number	Symbol	Contents	Amount (mL)
-	T03-3685-01	CAL	Hematology Calibrator	6.1 mL

ADVIA 120 OPTIpoint

REF	Product Number	Contents	Amount (mL)
04408568	T03-3682-54	OPTIpoint	4 x 6.0 mL
-	T03-3682-01	OPTIpoint	6.0 mL

NOTE: Control products for the CSF Method and the Reticulocyte method are described in those sections.

Calibrator and Control Value Assignment Methods

All assigned target values for ADVIA SETpoint Hematology Calibrator and ADVIA TESTpoint Hematology Controls are traceable to NIST, ICSH, or NCCLS recommended procedures or approved reference procedures and materials.

The reference Red Blood Cell (RBC) and White Blood Cell (WBC) counts are performed using the recommended method with a single-channel aperture impedance counter. Macro-dilutions of 1:500 for WBC and 1:50,000 for RBC are made using Class A glassware. The reference Platelet Count (Plt) is performed using a hemocytometer and phase-contrast microscopy. The macro-dilution for Plt is 1:125 using 1% ammonium oxalate as the diluent. The reference hemoglobin method is performed using the NCCLS H-15A approved standard method with ICSH traceable certified hemoglobin standards. The reference microhematocrit is performed using NCCLS H-7A approved standard method with tripotassium EDTA as the anticoagulant.

The System Specific Target Values (SSV) are assigned for ADVIA 120 SETpoint Hematology Calibrator and ADVIA 120 TESTpoint Hematology Control products by assaying each lot on an ADVIA 2120/2120i Hematology System that was calibrated using fresh, normal, whole-blood samples that were assigned RBC, WBC, Plt, Hct, and Hgb values using the methods described above.

ADVIA 120 OPTIpoint values are assigned using an ADVIA 2120/2120i Hematology System after standardizing the system with three reference oils. The index of refraction for each oil is determined with a refractometer that is calibrated using NIST standards. The index of refraction is measured at the wavelength of the ADVIA 2120/2120i system's laser as a function of temperature. During OPTIpoint value assignment, the temperature of the effluent is monitored so the correct index of refraction can be used to standardize the ADVIA 2120/2120i system. When stored at 2°C to 8°C, unopened ADVIA OPTIpoint (PN T03-3682-01), ADVIA SETpoint Calibrator (PN T03-3685-01), and ADVIA TESTpoint Reticu are stable until the last day of the month (expiration date) printed on the product label, unless otherwise stated. After being opened, ADVIA OPTIpoint is stable for 7 days when stored closed in its original containerat 2°C to 8°C.

Ancillary Reagents

The following ancillary reagents are necessary to operate the ADVIA 2120/2120i Hematology System. All reagents must be free of particulates and other foreign matter.

ADVIA 120 SHEATH/RINSE

REF	Product Number	Symbol	Contents	Amount (L)
02337140	T01-3664-01	SHEATH/RINSE	SHEATH/RINSE	10 L
01554628	T01-3623-01	SHEATH/RINSE	SHEATH/RINSE	20 L

ADVIA 120 EZ KLEEN

REF	Product Number	Symbol	Contents	Amount (mL)
05101601	T01-3624-54		EZ KLEEN	4 x 810 mL
-	T01-3624-01	EZ KLEEN	EZ KLEEN	810 mL

ADVIA 120 DEFOAMER

REF	Product Number	Symbol	Contents	Amount (mL)
09119084	T01-3625-54		DEFOAMER	4 x 125 mL
-	T01-3625-01	DEFOAMER	DEFOAMER	125 mL

Operation

To run samples on your ADVIA 2120/2120i Hematology System, refer to the Daily Routine.

NOTICE
Any modification of computer disks and/or the programs contained on such disks can adversely affect the control of instrument performance and thereby invalidate the results obtained as well as the claims that have been made regarding system performance.

In no event shall Siemens be liable for errors that are introduced by, or result from, any modification or alteration of the computer disks and/or the programs contained on such disks by the user, or for any direct or indirect consequences resulting from such modification or alteration.

Calculation of Results

The system automatically performs all calculations necessary for obtaining final results.

Through the use of flagging algorithms, laboratory personnel are alerted to suspected abnormal conditions. These conditions are indicated by the appropriate flag (such as *, +, and/or color highlighting). Whenever a flag is triggered, the user should review the results and take appropriate action.

NOTE: The ADVIA 2120/2120i Hematology System performs all calculations using 64-bit floating point numbers, IEEE standard, as provided by Intel processors. The number of significant digits is 14. The system rounds numbers for display to the specified number of digits in the appropriate unit set. For example, 4.674999999 becomes 4.67, 4.675 becomes 4.68. This means that certain things might appear inconsistent, such as the % diff appearing to add up to 99.9% instead of 100%or the displayed value of derived results such as HCT not appearing to be correct.

Example: HCT = RBC * MCV / 10.0

5.349 * 86.49 / 10 = 46.2635 is rounded to 46.3.
The system displays the values 5.34 * 86.4 / 10
which equal 46.1.

Interpretation of Results

System operators and laboratory supervisors are responsible for operating and maintaining Siemens products in accordance with the procedures described in the applicable Product Labeling (online documentation, package inserts, bulletins), and for determining that product performance conforms to the applicable claims.

If, under these prescribed conditions of operation and maintenance, an aberrant or abnormal result, as defined by the laboratory protocol, occurs, laboratory personnel should first make certain that the system is performing and is being operated in accordance with the Product Labeling; then follow the laboratory protocol for advising the clinician of a result that appears to have deviated from the norms established by the laboratory.

Siemens products do not make diagnoses on patients. Siemens intends its diagnostic products (systems, reagents, software, hardware) to be used to collect data reflecting the patient's chemical, hematological, or immunological status at a certain point in time. Such data must be used in conjunction with other diagnostic information and with the attending physician's evaluation of the patient's condition to arrive at a diagnosis and a clinical course of treatment.

Any malfunction of a Siemens diagnostic product (for example, failure to meet a performance specification or to perform as intended) should be appropriately addressed by laboratory personnel. Various sections of the Product Labeling address malfunctions and their possible effect on results.

Waste Disposal Requirements

Laws and regulations enacted to protect the environment and to encourage resource conservation require the disposal of hazardous and biohazardous wastes in a specified manner. Some of the wastes from the ADVIA 2120/2120i Hematology System can be classified as hazardous or biohazardous wastes. It is essential that the laboratory take appropriate steps to determine the laws and regulations applicable to their disposal and to effect compliance. If it is necessary to sample instrument effluent in order to evaluate compliance with applicable regulations, the laboratory should contact a local licensed biohazardous waste disposal firm for assistance.

The principal wastes associated with the use of the ADVIA 2120/2120i Hematology system are reagent containers, sample containers, system waste, and customer-replaceable system components. All ADVIA 2120/2120i reagent containers are manufactured of recyclable high-density polyethylene.

Sample containers with human specimens, control materials, and all reagents, should also be handled and disposed of in accordance with the prevailing regulations and guidelines of agencies with jurisdiction over the laboratory. Refer to the product label and to Material Safety Data Sheets for details concerning any special precautions related to the handling of reagents. Material Safety Data Sheets are available from Siemens.

Waste Analysis

After running the prescribed daily wash procedure and emptying the waste container, waste was collected from an ADVIA 2120/2120i Hematology System operating in three analytical modes: CBC, CBC/diff, and CBC/diff/retic. Using the autosampler, 300 CBC analytical cycles were run on fresh, whole blood samples, followed by the daily wash cycle. The waste was thoroughly mixed and samples were sent for analysis. The process was repeated for both the CBC/diff and CBC/diff/retic analytical modes. All analysis, with the exception of dimethyl formamide (DMF) was done by Tel Labs, Blessington, Ireland.

NOTE: For waste management purposes, the system generates approximately 20 mL of waste during a typical CBC/diff/retic cycle, including SHEATH/RINSE.

Concentrations are mg/L (ppm) unless otherwise noted.

< indicates that the concentration is below the limit of detection.

* indicates a calculated concentration

Analyte	CBC	CBC/Diff	CBC/Diff/Retic
pH	8.5	7.7	7.4
Phosphate as P	460	530	500
Chloride	5445	4268	4273
Barium	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01
Arsenic	<0.01	<0.01	<0.01
Selenium	<0.01	<0.01	<0.01
Mercury	<0.001	<0.001	<0.001
Nickel	<0.01	<0.01	<0.01
Chromium	<0.01	<0.01	<0.01
Zinc	0.05	0.05	0.09
Cadmium	<0.005	<0.005	<0.005
Copper	0.02	0.01	0.01
Lead	<0.01	<0.01	<0.01
TOC (g/dL)	0.2	2.1	1.6
Cyanide	2.38	0.33	<0.05
Formaldehyde*	0	896	720
adsorbable organic halide	0.59	1.97	2.32
purgeable organic halide (mg/dL of Cl)	0.52	1.03	2.52
DMF			269

DMF was calculated by Siemens based on the dilution of the autoRETIC reagent in the system waste.

Volatile Organic Compounds in System Waste

Concentrations are µg/L (ppb) unless otherwise noted.

< indicates that the concentration is below the limit of detection.

Determinand	CBC	CBC/Diff	CBC/Diff/Retic
Dichloromethane	<25	<25	<25

Determinand	CBC	CBC/Diff	CBC/Diff/Retic
Chloroform	3	2	27
1,1,1 - Trichloroethane	<5	<5	<5
Carbon tetrachloride	<1	<1	<1
Benzene	<1	<1	<1
1,2 - Dichloroethane	<1	<1	<1
Trichloroethene	<1	<1	<1
Bromodichloromethane	<1	<1	<1
Dibromochloromethane	<1	<1	<1
1,1,2,2 - Tetrachloroethane	<1	<1	<1
Toluene	<1	<1	<1
Freon - 113	<1	<1	<1
Tetrachloroethene	<1	<1	<1
Chlorobenzene	15	5	3
Ethylbenzene	<1	<1	<1
m/p Xylenes	<1	<1	<1
o Xylene	<1	<1	<1
Hexachlorobutadiene	<1	<1	<1
4-Chlorotoluene	<1	<1	<1
2-Chlorotoluene	<1	<1	<1
Isopropyl benzene	<1	<1	<1
Bromoform	<1	<1	<1
Styrene	<1	<1	<1
1,3,5 -Trichlorobenzene	<1	<1	<1
1,2,3 -Trichlorobenzene	<1	<1	<1
1,2,4 -Trichlorobenzene	<1	<1	<1
1,2 - Dichlorobenzene	16	4	2
1,3 - Dichlorobenzene	<1	<1	<1
1,4 - Dichlorobenzene	14	4	2
alpha Methyl styrene	<1	<1	<1

Determinand	CBC	CBC/Diff	CBC/Diff/Retic
1,1 - Dichloroethane	<1	<1	<1
1,1,2 - Trichloroethane	<1	<1	<1
1,1 - Dichloroethene	<1	<1	<1
trans 1,2 - Dichloroethene	<1	<1	<1
cis 1,2 - Dichloroethene	<1	<1	<1
Tert-butyl methyl ether	<1	<1	<1
Vinyl chloride	<25	<25	<25
Methyl methacrylate	<5	<5	<5
Freon-11	<25	<25	<25

System Method Information

The method information provided for the Reticulocyte Count (RETIC) method, the Complete Blood Count (CBC) method, and the Differential (DIFF) method is consistent with the recommendations described in CLSI Document M29-A3 and by the United States Food and Drug Administration in Title 21 Code of Federal Regulations.

A laboratory procedure manual is mandatory for good laboratory practice and regulatory compliance. To aid in the preparation of a laboratory procedure manual, refer to the cross-reference that compares the organization of our method information with the guidelines for Clinical Laboratory Procedure Manuals (formerly NCCLS) in *Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition.* 2005. CLSI Document M29-A3.

Siemens Method information is presented in a consistent format organized into the following categories or section headings:

Intended Use

Principles of the Procedure

Reagents

Storage and Stability

Sample Handling

Materials Required but not Provided

Procedure

Quality Control

Gain Adjustment

Calibration

Results

Limitations of the Procedure

Expected Values

Performance Characteristics

Available from the National Committee for Clinical Laboratory Standards, 940 West Valley Road, Suite 1400, Wayne, PA, 19087-1898

System Method Information: Intended Use

This topic contains a brief statement of intended use for the assay as an *in vitro* diagnostic procedure for quantitating analytes in human whole blood.

System Method Information: Principles of the Procedure

This topic provides a physical, chemical, and/or biological explanation of the assay and a brief description of the reactions, where applicable.

System Method Information: Reagents

These topics describe the reagents required to perform the assay including reagent packaging information, product descriptions, materials required but not provided, and reagent preparation instructions.

The following briefly explains the significance of signal words used throughout these topics:

CAUTION!
Indicates a hazard that could cause illness, burns, skin reactions, and so on. This hazard is assigned to substances such as diluted acids, mild caustics, minor skin irritants, or combustible materials.

ATTENTION
Indicates that a specific risk exists to the user or performance.

NOTE
Indicates additional information that is useful for the proper operation of the system.

NOTE: The customer must maintain a constant awareness of the hazards and warnings associated with all reagents. Where necessary, appropriate safety equipment should be used (e.g., eye protection, gloves, lab coats). Users should follow the handling and safety precautions specified in the Material Safety Data Sheets available from Siemens.

Reagent and Calibrator Preparation
Reagents and calibrators are ready-to-use and require no preparation.

System Method Information: Storage and Stability

Reagent and calibrator storage and expiration dates are printed on the product label. When stored unopened these products are stable through the last day of the month stated in the expiration date, unless stated otherwise.

System Method Information: Sample Handling

Whole blood specimens whose parameter values exceed the analytical range may be diluted with autologous plasma or isotonic saline and reassayed unless stated otherwise in the method-specific information.

System Method Information: Materials Required but not Provided

This topic lists the additional materials, other than the reagents, that are required to perform the methods.

System Method Information: Procedure

For general operating instructions, refer to the Daily Routine.

System Method Information: Quality Control

This section specifies recommended quality control material and quality control frequency for the individual method. In general, Siemens recommends that ADVIA 2120/2120i Hematology Systems be monitored using the ADVIA TESTpoint Hematology Controls (Low, Normal, and High) and ADVIA TESTpoint Reticulocyte Control (Low and High). Please refer to page 5 for product descriptions.

Control materials should be assayed at the beginning of each shift or at some other interval chosen by the laboratory, after a reagent lot number change, and after replacement of any part or component of the analytical module that may affect analytical performance.

The laboratory must evaluate all control results before reporting patient results. If control results fail to meet the laboratory's established criteria for acceptability, all patient test results obtained in the unacceptable test run must be evaluated to determine if patient test results were adversely affected. The laboratory should take and document appropriate corrective actions, which may include recalibration and reassaying of patient samples, before reporting patient results.

System Method Information: Gain Adjustment

The gain adjustment procedure is used to adjust the amplification of signals in a channel to properly position the cell signatures within a cytogram.

Materials Required for Adjusting Gains

- **Whole Blood**
- **ADVIA 120 OPTIPOINT**

REF	Product Number	Contents	Amount (mL)
04408568	T03-3682-54	OPTIpoint	4 x 6.0 mL
-	T03-3682-01	OPTIpoint	6.0 mL

- **ADVIA 120 SETpoint Calibrator**

REF	Product Number	Symbol	Contents	Amount (mL)
09170071	T03-3685-52		Hematology Calibrator	2 x 6.1 mL
-	T03-3685-01	CAL	Hematology Calibrator	6.1 mL

System Method Information: Calibration

This topic specifies the calibration type, frequency, and procedure for each method and identifies the calibration material to be used, where appropriate.

Calibration Procedure

The system must be calibrated for all parameters except % Retics. Siemens recommends the use of ADVIA SETpoint Calibrator (Prod.No. T03-3685-01).

Calibration should be performed in each of the following cases:

- Upon installation of the system.
- If there is a significant shift in control values after the replacement of a critical hardware component or reagent lot, after checking gains.
- Anytime control results and/or moving averages are out of range and it has been verified that the out-of-control condition is instrument-related.

System Method Information: Results

This topic describes expected flags or messages associated with analytical results.

System Method Information: Limitations of the Procedure

This topic describes substances, conditions, and patient states that have been reported to cause actual or apparent changes in the analytical results.

Siemens makes every effort to identify in the Troubleshooting, Maintenance, and Bibliography topics of the Product Labeling, the potential effects caused by instruments, reagents, or endogenous substances, including known interferences on patient results. However, it is impossible to provide information that would be applicable to every clinical situation. This information is provided in lieu of attempting to define the need for additional testing which involves medical judgement in individual cases. The decision whether or not to report a diagnostic result rests with the laboratory.

System Method Information: Expected Values

Ranges of expected values can vary depending on age, sex, diet, location, etc; therefore, it is recommended that each laboratory establish its own range of expected values.

System Method Information: Performance Characteristics

These topics provide technical information related to method performance characteristics, including imprecision, correlation data, analytical range, and carryover.

A description of each statistical parameter and the protocol followed to compute that parameter are as follows:

Imprecision

Imprecision is defined as the degree of variability among repeated measurements of the same sample.

Within-run imprecision refers to the reproducibility of the method when samples are assayed within a single run.

The imprecision values for each method, described on each of their respective Method Sheets, are point estimates of average imprecision that can be expected on the system. Because this is a point estimate, any single system tested with a similar protocol could yield a different estimate of imprecision and yet not be significantly different from the published average imprecision.

Correlation Data

Correlation data were determined using human whole blood samples by comparing the performance of the ADVIA 120 Hematology System with the performance of a reference method or a comparative system, where applicable.

Regression statistics were computed using a protocol similar to that recommended in the CLSI Document M29-A3, *Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition.* 2005.

Regression data in each method indicate the linear least squares fit between the ADVIA 120 Hematology System (**y**) and the comparative system/method (**x**), unless noted otherwise.

Carryover

This topic lists the sample carryover for the ADVIA 120 Hematology System.

Analytical Range

This topic describes the concentration range across which acceptable results can be obtained from the method.

Some specimens may exceed the range of the method and produce error flags or messages.

CLSI Document M29-A3 and Siemens Method Topics Cross Reference

CLSI Approved Guideline M29-A3		Siemens Method Topics
5.1.2	**Title**	
5.1.2.1	Title	
5.1.2.2	Type of Specimen	Intended Use
5.1.2.3	Method or instrumentation in subtitle	Intended Use
5.1.3	**Principle**	
5.1.3.1	Type of reaction(s) involved	Principles of the Procedure
5.1.3.2	Clinical reasons for performing the test	Intended Use
5.1.4	**Specimen**	
5.1.4.1	State the conditions for patient preparation	Sample Handling / Limitations of the Procedure
5.1.4.2	Type of specimen	Intended Use / Sample Handling
5.1.4.3	Special handling conditions	Sample Handling
5.1.5	**Reagents**	
5.1.5.1	List reagents, supplies, and equipment	Reagents
5.1.5.2	Directions for preparation	Reagents
5.1.5.3	Parameters used to determine acceptable reagent performance	Storage and Stability / Quality Control
5.1.5.4	Storage requirements	Storage and Stability
5.1.6	**Calibration**	
5.1.6.1	Standard preparation	Not applicable
5.1.6.2	Calibration procedure	Calibration
5.1.7	**Quality Control**	
5.1.7.1	Identify control materials to be used	Quality Control

CLSI Approved Guideline M29-A3		Siemens Method Topics
5.1.7.2	Instructions for preparing and handling control materials	Control Package Insert
5.1.7.3	Control frequency	Quality Control
5.1.7.4	Description of control tolerance limits	Control Package Insert
5.1.7.5	Corrective actions to be taken when limits are exceeded	According to Individual Laboratory Practice
5.1.7.6	How QC data are recorded and stored	Quality Control / According to Individual Laboratory Practice
5.1.7.7	If no controls are available, list alternatives	Quality Control, if applicable
5.1.8	**Procedure - Stepwise**	
5.1.8.1	Detailed stepwise instructions	Procedure
5.1.8.2	Centrifugation requirements	Not applicable
5.1.8.3	Specify special glassware	Not applicable
5.1.8.4	Specify the following for photometric measurements:	
	Type of instrument	Not applicable
	Wavelength	
	Cuvette size	
	Solution used as a blank	Procedure
	Linearity	Performance Characteristics
	How the raw data are read	Calculations
	Allowable time intervals	Not applicable
	Stability of final solution	Not applicable
5.1.9	**Calculations**	
5.1.9.1	Give stepwise instructions	Calculations
5.1.9.2	Give the equation	Calculations

CLSI Approved Guideline M29-A3		Siemens Method Topics
5.1.9.3	Give an example	Calculations
5.1.10	**Reporting results**	
5.1.10.1	State reference ranges	Expected Values
5.1.10.2	Identify procedures to be used in reporting results to the physician	According to Individual Laboratory Practice
5.1.10.3	Guidelines on acceptable reporting format	Results / According to Individual Laboratory Practice
5.1.11	**Procedure Notes**	
5.1.11.1	Explain reasons for special precautions	Sample Handling / Limitations
5.1.11.2	List possible sources of error	Sample Handling / Limitations
5.1.11.3	Include helpful hints	Procedure
5.1.11.4	Clinical situations that may influence test validity	Sample Handling / Limitations
5.1.11.5	Acceptable alternative procedures, expected differences	Performance Characteristics
5.1.11.6	Enlarge upon clinical applications	According to Individual Laboratory Practice
5.1.12	**Limitation of Procedure**	
5.1.12.1	State linearity and/or detection limits	Performance Characteristics
5.1.12.2	State known interfering substances	Interfering Substances / Performance Characteristics
5.1.13	**Bibliography**	
5.1.13.1	Literature references	Bibliography
5.1.13.2	Manufacturer product literature	To obtain the version of the online documentation, click **Options** on the menu bar of the help window, and then click **Version**.

CLSI Approved Guideline M29-A3		Siemens Method Topics
5.1.13.3	Textbooks	
5.1.13.4	Standard Publications	
5.1.13.5	Written personal communications	
5.1.13.6	Research including supporting data for validation of methods	

CBC Method

Intended Use

The ADVIA 2120/2120i Hematology System Complete Blood Count (CBC) method is intended to quantitatively measure the following hematological parameters:

White Blood Cell count (WBC)

Red Blood Cell count (RBC)

Hemoglobin concentration (HGB)

Hematocrit (HCT)

Mean Corpuscular Volume (MCV)

Mean Corpuscular Hemoglobin (MCH)

Mean Corpuscular Hemoglobin Concentration (MCHC)

Corpuscular Hemoglobin Concentration Mean (CHCM)

Cellular Hemoglobin Content (CH)

Red Cell Volume Distribution Width (RDW)

Hemoglobin Concentration Distribution Width (HDW)

Platelet Count (PLT)

Mean Platelet Volume (MPV)

Principles of the Procedure

WBC Count

The whole blood sample is mixed with ADVIA 120 BASO reagent that contains acid and surfactant. The red cells are hemolyzed, and the white blood cells are then analyzed using 2 angle laser light scatter signals.

Bibliography

Cremins J and Orlik J: Leukocyte differential method. US Patent 5,518,928 (1996)

RBC / Platelet Count

Both red blood cells and platelets are analyzed by a single optical cytometer after appropriate dilution of the blood sample with ADVIA 120 RBC/PLT reagent. The red blood cells are isovolumetrically sphered and lightly fixed with glutaraldehyde to preserve the spherical shape. Red cells and platelets are counted from the signals from a common detector with 2 different gain settings.

On the ADVIA 2120/2120i Hematology system the platelet signals are amplified considerably more than the RBC signals. Coincidence correction is made to each of the counts so that accurate counts are made over a wide range of each cell type.

Bibliography

Kim YR and Ornstein L: Isovolumetric sphering of erythrocytes for more accurate and precise cell volume measurement by flow cytometry. *Cytometry* **3**(b):419-427 (1983)

Zelmanovic, *et al*: US Patent pending

RBC / Platelet Size

The method of sizing red cells and platelets uses the simultaneous measurement of laser light scattered at 2 different angular intervals, which eliminates the adverse effect of variation in cellular hemoglobin concentration on the determination of cell volume.

Bibliography

Kerker M: The Scattering of Light and Other Electromagnetic Radiation. Academic, New York, NY, Chapter 3 (1969)

Groner W and Tycko DH: Characterizing blood cells by biophysical measurements in flow. *Blood Cells* **6**:141-157 (1980)

Hemoglobin Concentration

The hemoglobin method is a modification of the manual cyanmethemoglobin method developed by the International Committee for Standardization in Hematology (ICSH).

Bibliography

ICSH Recommendations for Reference Method for Hemoglobinometry in Human Blood, ICSH Standard EP **6**/2 (1977)

Specifications for international hemoglobincyanide reference preparation ICSH Standard EP **6**/e (1977). *J Clin Pathol* **31**:139 (1978)

Indices

The red cell indices MCH and MCHC are derived from the mathematical calculation of the RBC count, the total hemoglobin, and the MCV determination.

The HCT value is calculated from the RBC count and the MCV.

The RDW and HDW values are calculated from the cell-by-cell measurement of cell volume and hemoglobin concentration.

The CH represents the mean of the cell hemoglobin content histogram.

The CHCM is calculated as the mean of the RBC hemoglobin concentration histogram.

Bibliography

Wintrobe MM: The size and hemoglobin content of the erythrocyte. *J Lab Clin Med* **17**:899-911 (1932)

Bessman JD: What's an %RDW? *Am J Clin Pathol* **76**:242 (1981)

Mohandas N, *et al*: Accurate and independent measurement of volume and hemoglobin concentration of individual red cells by laser light scattering. *Blood* **68**:506-513 (1986)

Reagents

The following ready-to-use reagents are required to perform the CBC method and maintain the ADVIA 2120/2120i Hematology System. You must use either the CBC TIMEPAC or the CN-FREE CBC TIMEPAC along with the SHEATH/RINSE.

ADVIA 120 CBC TIMEPAC

REF	Product Number	Symbol	Contents	Amount (mL)
09826813	T01-3620-52		CBC TIMEPAC	
-	T01-3625-01	DEFOAMER	DEFOAMER	1 x 75 mL
-	T01-3627-01	RBC/PLT	RBC/PLT	2 x 2700 mL
-	T01-3628-01	HGB	HGB	2 x 1100 mL
-	T01-3629-01	BASO	BASO	2 x 1100 mL

ADVIA 120 CN-FREE CBC TIMEPAC

REF	Product Number	Symbol	Contents	Amount (mL)
08008297	T01-3626-52		CN-FREE CBC TIMEPAC	
-	T01-3625-01	DEFOAMER	DEFOAMER	1 x 75 mL
-	T01-3627-01	RBC/PLT	RBC/PLT	2 x 2700 mL
-	T01-3629-01	BASO	BASO	2 x 1100 mL
-	T01-4288-01	HGB	CN-FREE HGB	2 x 1100 mL

ADVIA 120 SHEATH/RINSE

REF	Product Number	Symbol	Contents	Amount (L)
02337140	T01-3664-01	SHEATH/RINSE	SHEATH/RINSE	10 L
01554628	T01-3623-01	SHEATH/RINSE	SHEATH/RINSE	20 L

ADVIA 120 DEFOAMER

(PN T01-3625-01) 1 x 75 mL

ADVIA 120 DEFOAMER contains:

Silicone emulsion, 100%

Shake before use.

For *in vitro* diagnostic use.

ADVIA 120 RBC / PLT

(PN T01-3627-01) 2 x 2700 mL

ADVIA 120 RBC/PLT contains:

Sodium dodecyl sulfate, 0.035 mmol/L

Disodium EDTA dihydrate, 4.03 mmol/L

Tetrasodium EDTA dihydrate, 3.36 mmol/L

Sodium chloride, 109.3 mmol/L

Glutaraldehyde, 0.11%

Buffer

For *in vitro* diagnostic use.

ADVIA 120 HGB

(PN T01-3628-01) 2 x 1100 mL

ADVIA 120 HGB contains:

Potassium cyanide, 23 mmol/L

Dimethyl laurylamine oxide, 2.0%



HARMFUL!

R20/21/22

S24/25, S29, S36/37, S45

Harmful by inhalation, in contact with skin, and if swallowed. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves. In case of accident, or if you feel unwell, seek medical advice immediately (show the label where possible). Do not empty into drains.

For *in vitro* diagnostic use.

ADVIA 120 BASO

(PN T01-3629-01) 2 x 1100 mL

ADVIA 120 BASO contains

Hydrochloric acid, 9.00 mmol/L

Phthalic acid, 21.49 mmol/L

Preservative

Surfactant

For *in vitro* diagnostic use.

ADVIA 120 CN-FREE HGB

(PN T01-4288-01) 2 x 1100 mL

ADVIA 120 CN-FREE HGB contains:

Dimethyl laurylamine oxide, 2.0%

For *in vitro* diagnostic use.

ADVIA 120 SHEATH / RINSE

(PN T01-3664-01) 1 x 10 L

(PN T01-3623-01) 1 x 20 L

ADVIA 120 SHEATH/RINSE contains:

Preservatives

Buffers

Surfactant

For *in vitro* diagnostic use.

Storage and Stability

Reagents

When stored between 15°C and 30°C:

- All unopened reagents are stable until the expiration date printed on the product label.
- Opened containers of ADVIA 120 BASO reagent, ADVIA 120 HGB reagent, and DEFOAMER are stable for 90 days.
- Opened containers of ADVIA 120 SHEATH/RINSE and ADVIA 120 RBC/PLT reagent are stable for 45 days.

Protect product from freezing.

When stored at 2°C to 8°C, unopened ADVIA OPTIpoint (PN T03-3682-01), ADVIA SETpoint Calibrator (PN T03-3685-01), and ADVIA TESTpoint Hematology Controls (PN T03-3686-01, Low; T03-3687-01, Normal; and T03-3688-01, High, respectively) are stable until the last day of the month of the expiration date printed on the product label unless stated otherwise.

After being opened, ADVIA OPTIpoint is stable for 7 days, ADVIA TESTpoint Hematology Controls are stable for 10 days, and the ADVIA SETpoint Calibrator is stable for 5 days, when stored closed in their original containers at 2°C to 8°C.

Gain Adjustment

The gain adjustment procedure is used to adjust the amplification signals in a channel to properly position the cell signatures within a cytogram.

Calibration

The system must be calibrated for all parameters except %RETIC. Siemens recommends the use of the ADVIA SETpoint Calibrator (PN T03-3685-01).

Calibration procedure should be performed:

- Upon installation of the system.
- If there is a significant shift in control values after the replacement of a critical hardware component or reagent lot, after checking gains.
- Anytime control results and/or moving averages are out of range and it has been verified that the out-of-control condition is instrument-related.

Sample Handling

Sample Collection

Collect whole blood in an evacuated blood collection tube containing EDTA as an anticoagulant. Blood samples should be refrigerated at a temperature between 2°C to 8°C if they will not be analyzed within eight (8) hours of phlebotomy. If a specimen has been refrigerated, allow it to equilibrate slowly to room temperature (15°C to 30°C) before mixing.

Sample Dilution

Whole blood specimens whose parameter values exceed the analytical range may be diluted with autologous plasma or isotonic saline and reassayed.

Sample Stability

The effect of the aging of blood was studied over a 72-hour period on the ADVIA 120 Hematology System.

Two whole-blood specimens drawn from 15 normal, apparently healthy donors were assayed shortly after phlebotomy and then again at intervals of 8, 24, 36, 48, 56, and 72 hours.

One of the whole-blood specimens from each pair was stored at room temperature while the corresponding specimen was stored at 2°C to 8°C in capped blood-collection tubes that contained EDTA as the anticoagulant.

The results indicate that CBC parameters are stable within two (2) standard deviations (within run precision) of the initial recovery for the specified time interval. The stability of the calculated parameters is limited to the stability of the least stable primary parameter.

Parameter	Room Temperature Stability (hours)	Refrigerated Temperature Stability (hours)
WBC ($10^3/\mu L$)	36	56
RBC ($10^6/\mu L$)	48	72
HGB (g/dL)	72	72
MCV (fL)	8	24
CH (pg)	36	53
CHCM (g/dL)	8	24
RDW (%)	72	72
HDW (g/dL)	72	72
PLT ($10^3/\mu L$)	48	48
MPV (fL)	8	8

Materials Required but not Provided

For the ADVIA 2120/2120i Hematology System, the other materials required to perform the ADVIA 2120/2120i CBC method are the various control materials, calibrators, ADVIA OPTIpoint, and other reagents or equipment specified in the "Methods Introduction" section.

Procedure

To run samples on your ADVIA 2120/2120i Hematology System, refer to the Daily Routine.

Quality Control

It is recommended that the system be controlled using ADVIA TESTpoint Hematology Controls. Please refer to page 5 for product descriptions. These controls are intended to be integrated into a clinical laboratory's own quality control program and procedures.

Control materials should be assayed:

- At the beginning of each shift or at some other interval chosen by the laboratory.
- After a reagent lot number change.
- After replacement of any part or component of the analytical module that may affect analytical performance.

As an option, laboratories may run a retained patient sample periodically to monitor performance trends.

Results

The ADVIA 2120/2120i Hematology System automatically performs all calculations necessary for obtaining final results.

Through the use of flagging algorithms, laboratory personnel are alerted to suspected abnormal conditions. These conditions are indicated by the appropriate flag (such as *, +, and/or color highlighting). Whenever a flag is triggered, the user should review the results and take appropriate action.

Limitations of the Procedure

The limitations of the procedure are as listed:

1. Some irreversibly sickled cells that occur in cases of sickle cell anemia may not completely sphere in the system, resulting in an elevated RDW and therefore an underestimation of the MCV. Sickled cells may cause erroneous results in other RBC parameters.
2. Very high WBC counts (>200 x 10^3 cells/µL) elevate the red blood cell count.
3. Samples with cold agglutinins may falsely lower the red blood cell count.
4. Samples with high WBC counts (>60 x 10^3 cells/µL), or platelet clumps, and neonatal samples may interfere with the hemoglobin determination.
5. Samples with extreme lipemia, chylomicrons, or extremely high bilirubin might interfere with and elevate the hemoglobin results obtained from the hemoglobin method, including the MCHC.

 Since these interferences do not affect the cell-by-cell hemoglobin concentration values obtained from the RBC method, the CHCM values are unaffected. If the MCHC and CHCM differ by more than 1.9 g/dL, a "Comparison Error" system flag alerts the operator to this condition.
6. Patient specimens with nucleated RBCs (particularly neonate specimens) may falsely elevate the WBC count. When manually correcting the WBC count for the presence of NRBCs, use the WBCB count.
7. Samples from patients receiving total parenteral nutrition (TPN) including high lipid dosage may exhibit falsely elevated platelet counts. These samples can include lipid droplets that appear in the platelet counting region, thus elevating the platelet count.

Expected Values

The range of expected values can vary depending on age, sex, diet, and location. It is recommended that each laboratory establish its own range of expected values.

The following range of expected values is based upon the duplicate assay of 60 whole-blood specimens obtained from an adult population of assumed healthy individuals.

Parameter	Low Value	High Value
WBC (10^3/µL)	3.8	8.6
RBC (10^6/µL)	4.1	6.0
HGB (g/dL)	10	16
HCT (%)	33	57

Parameter	Low Value	High Value
MCV (fL)	76	100
MCH (pg)	24	31
MCHC (g/dL)	28	34
CH (pg)	24	35
CHCM (g/dL)	29	34
RDW (%)	12	15
HDW (g/dL)	1.9	3.0
PLT ($10^3/\mu L$)	140	360
MPV (fL)	7	9

Performance Characteristics: Imprecision

A total of 18 runs were performed using multiple samples.

The following estimates of imprecision were obtained by taking 25 aspirations from each whole-blood sample. Each of the sample selectivity modes was tested by sampling from opened tubes, and with the manual and automated closed-tube samplers.

Parameter	Mean	Standard Deviation	CV (%)
WBC ($10^3/\mu L$)	5.91	0.16	2.7
RBC ($10^6/\mu L$)	4.82	0.05	1.0
HGB (g/dL)	13.3	0.11	0.8
MCV (fL)	81.0	0.3	0.4
CH (pg)	26.5	0.05	0.2
CHCM (g/dL)	30.6	0.14	0.5
RDW (%)	12.3	0.07	0.6
HDW (g/dL)	2.56	0.02	0.8
PLT ($10^3/\mu L$)	256	6.9	2.7
MPV (fL)	8.1	0.11	1.4

Performance Characteristics: Correlation Data

The performance of the ADVIA 120 Hematology System was compared with the performance of the Technicon H●3 RTC System (x) using whole blood from 60 normal donors and 70 hospital donors with each sample run in duplicate (n = 260).

The following Regression statistics were computed using a protocol similar to that recommended in the NCCLS document EP9-A, *Method Comparison and Bias Estimation Using Patient Samples*; Approved Guideline (1995).

Parameter	Comparative System or Method	Regression Equation (y=)	r	Sy.x
WBC ($10^3/\mu L$)	Technicon H•3 RTC	1.06x - 0.74	0.997	1.42
RBC ($10^6/\mu L$)	Technicon H•3 RTC	0.98x + 0.11	0.997	0.07
HGB (g/dL)	Technicon H•3 RTC	1.01x - 0.2	0.997	0.2
MCV (fL)	Technicon H•3 RTC	0.90x + 9.6	0.994	1.1
CH (pg)	Technicon H•3 RTC	1.00x + 1.2	0.990	0.6
CHCM (g/dL)	Technicon H•3 RTC	1.17x - 6.5	0.974	0.5
RDW (%)	Technicon H•3 RTC	0.86x + 1.3	0.980	0.6
HDW (g/dL)	Technicon H•3 RTC	0.98x + 0.06	0.959	0.13
PLT ($10^3/\mu L$)	Technicon H•3 RTC	1.08x - 2.0	0.991	27
MPV (fL)	Technicon H•3 RTC	0.76x + 0.9	0.925	0.4

x = Technicon H•3 RTC system

y = ADVIA 120 Hematology system

Performance Characteristics: Carryover

Sample carryover for the ADVIA 120 Hematology System was measured for WBC, RBC, HGB, and PLT. The performance specification for carryover is ≤ 1% for all parameters.

Carryover was evaluated on the ADVIA 120 Hematology System by the aspiration of a high pool prepared for linearity testing, followed by 3 aspirations of cell-free plasma. Percent carryover was calculated as:

% Carryover = $[(L_1 - L_3) / H] \times 100$

L_1 = the count for the first aspiration of cell-free plasma

L_3 = the count for the third aspiration of cell-free plasma

H = the count from the high pool

The following results were obtained:

Parameter	Observed Carryover
WBC	0.4%
RBC	0.2%
HGB	0.2%

PLT	0.1%

Performance Characteristics: Analytical Range

The analytical range for the ADVIA 2120/2120i Hematology System was established by making serial dilutions of samples specially prepared to have high analyte values. Multiple assays of the specially prepared pools were performed on the system.

Parameter	Range Evaluated	Maximum Observed Deviation
WBC ($10^3/\mu L$)	0.02 to 21.83	0.46 x $10^3/\mu L$
	20.48 to 409.55	4.1%
RBC ($10^6/\mu L$)	0.0 to 2.65	0.03 x $10^6/\mu L$
	2.65 to 6.76	1.1%
HGB (g/dL)	0.0 to 8.6	0.2 g/dL
	8.6 to 22.5	2.5%
PLT ($10^3/\mu L$)	5 to 208	10 x $10^3/\mu L$
	205 to 3983	4.9%

CSF Method

Intended Use

The ADVIA 2120/2120i Hematology Cerebrospinal Fluid (CSF) assay is intended for *in vitro* diagnostic use in the quantitative determination of blood cells in cerebrospinal fluid (CSF) specimens. The CSF assay provides leukocyte (CSF WBC) and erythrocyte (CSF RBC) counts as well as absolute and percentage counts for the CSF WBC differential. To arrive at a diagnosis and a course of treatment, results from the CSF assay should be used in conjunction with other diagnostic information and the attending health-care professional's evaluation of the patient's condition.

Principles of the Procedure

Hematological analysis of CSF specimens has historically been performed in laboratories using manual cell counting and differentiation methods. Blood cells in normal CSF samples are usually present in very low numbers. The WBC count can provide important clinical information for the differential diagnosis of various cerebral diseases. The WBC count in CSF is used in the diagnosis of bacterial meningitis, differential diagnosis of viral and fungal meningitis, encephalitis, neurological disorders, the diagnosis of leukemias with CSF involvement, and for monitoring patient therapy for leukemias and lymphomas. An elevated WBC count with increased proportions of polymorphonuclear cells is usually an indication of bacterial meningitis. In viral meningoencephalitis, the cell counts may be lower with a predominance of mononuclear cells. An unusually elevated RBC count can be an indication of cerebral hemorrhage or a traumatic spinal tap.

The ADVIA 120 CSF assay provides a rapid, automated analysis of CSF samples by counting and distinguishing certain cell types. When using the ADVIA 120 CSF assay, the CSF sample is mixed with ADVIA 120 CSF reagent, which spheres and fixes the cells. After a minimum 4-minute to 4-hour incubation period, the prepared sample is then aspirated directly into the ADVIA 120 system. The cells are then detected and enumerated based on light scatter and absorbance measurements using the ADVIA 120 laser optics. A scatter versus scatter and scatter versus absorbance cytogram is displayed with the thresholds and results automatically calculated for each sample. Reportable parameters are WBC and RBC counts along with absolute and percentage counts for neutrophils, lymphocytes, monocytes, polymorphonuclear (PMN), and mononuclear (MN) cells. A research-use-only eosinophil count is also given.

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Reagent

ADVIA 120 CSF Reagent

REF	Product Number	Symbol	Contents	Amount (mL)
04274197	T01-4610-01	CSF REAGENT	CSF Reagent	1 x 8 mL
-	T01-4611-01	CSF REAGENT	CSF Reagent	8 mL

ADVIA 120 CSF Reagent contains a sphering agent and fixatives in a buffered aqueous solution. The ADVIA 120 CSF Reagent (PN T01-4610-01) contains one 8 mL bottle with sufficient reagent to analyze 25 samples or controls.

ADVIA 120 CSF Reagent contains:

Formaldehyde, 2% (Wt)

Glutaraldehyde, 0.28 % (Wt)

Buffer

Surfactants



HARMFUL! IRRITANT!

R40, R43 Contains 2% (Wt) formaldehyde. Limited evidence of a carcinogenic

S36/37 effect. May cause sensitization by skin contact. Wear suitable protective clothing and gloves.

For *in vitro* diagnostic use.

Storage and Stability

Reagents

When stored between 18°C and 30°C:

- All unopened reagents are stable until the expiration date printed on the product label. *DO NOT FREEZE*.
- Opened containers of ADVIA 120 CSF reagent are stable for one month.
- The product should be clear, colorless, and free of visible particulate matter. Do not use if product is cloudy, discolored, or contains visible matter.

Controls

When stored between 2°C and 8°C:

- When stored as directed, unopened controls are stable through the expiration date printed on the product label. *DO NOT FREEZE*.
- Opened containers are stable for 10 days.

Gain Adjustment

The gain adjustment procedure is used to adjust the amplification signals in a channel to properly position the cell signatures within a cytogram. There are no CSF-specific gain adjustments required.

Calibration

Calibration is not required for the CSF Assay. Accurate cell counts are derived through correct RBC gain adjustment.

Sample Handling

Sample Dilution

Samples may be diluted up to 1:10 [1 part sample and 9 parts phosphate buffered saline (PBS) or normal saline] before preparation with CSF reagent. Sample

Sample Stability

CSF patient samples are not stable and should be assayed as soon as possible after collection. Siemens recommends that CSF patient samples be prepared with CSF reagent within one hour after collection. Once prepared with CSF reagent, the prepared sample is stable between 4 minutes and 4 hours when stored at 18ºC – 30ºC.

Prepared CSF patient samples and prepared ADVIA 120 TESTpoint CSF controls contain 1% and 1.5% formaldehyde, respectively. These should be disposed of according to local environmental regulations.

Sample and Control Preparation

Use the following procedure to prepare CSF samples or control products for analysis on the ADVIA 2120/2120i Hematology System.

NOTE: The CSF Assay requires a CSF sample volume of 300 µL. Reserve sufficient sample volume for slide preparation or additional analysis if necessary. Samples with high RBC counts may require dilution prior to preparation with CSF Reagent. Phosphate buffered saline (PBS) is the preferred diluent for these samples, although normal saline may be also used. Samples diluted in normal saline should be prepared with CSF reagent immediately after dilution and will require a longer incubation period than undiluted samples or samples diluted in PBS.

1. Add 300 µL of thoroughly mixed CSF sample (patient or control) to 300 µL of CSF Reagent in a labeled glass or plastic test tube.
2. Cap and mix the prepared sample by gently inverting it 5–10 times or vortexing for 5 seconds. Care should be taken to avoid foaming.
3. Incubate it at room temperature for at least 4 minutes. Samples should be assayed within 4 hours of preparation.
4. After preparing the sample, replace the reagent cap and return any quality control materials to refrigerated storage.
5. After appropriate incubation, mix the sample again by inverting it 5–10 times or vortexing it for 5 seconds immediately before aspirating on the ADVIA 2120/2120i Hematology System. Cells in prepared CSF samples will settle quickly due to low viscosity.

Materials Required but not Provided

For the ADVIA 2120/2120i Hematology System, the other materials required to perform the ADVIA 120 CSF method are the various control materials, calibrators, ADVIA OPTIpoint, and other reagents or equipment specified in the "Methods Introduction" section.

Procedure for Running CSF Samples

To run CSF samples on your ADVIA 120 Hematology System, perform the following procedure:

1. If the Standby indicator is lit, press the Standby button to put the system into Ready to Run mode.

2. Using the Order Entry tab, create a workorder for each CSF sample preparation to be analyzed. Include sample physical characteristics in the Ocom field and, if necessary, the dilution factor in the Dil field. Enter **CSF** as the sample type and select the **Tab** key in order to see the correct menu of tests.

3. At the Routine Operations menu, select the **Manual Sample ID** tab.

4. Select the **Cerebrospinal Fluid** button.

5. Select **Initialize** to wash the pathways and obtain a flow cell background count. After the system has completed the initialization cycle and the sample aspiration light is green, verify that background counts in the flow cell pathway are within acceptable limits. If background counts are not acceptable, perform one aspiration of a 25% bleach solution once, followed by two aspirations of distilled water or saline. The recommended values for these limits are:

 CSF R Count = 0

 CSF PHA WBC = 0

 CSF PHA Total <=10

 If background counts are not acceptable, perform one aspiration of a 25% bleach solution once, followed by two aspirations of distilled water or saline.

 NOTE: The CSF Wash cycle rinses the sample pathways without performing a background count. The CSF Refresh cycle refreshes the flow cell background count without rinsing the sample pathways. The background counts are stored in the startup log.

6. Select **Primer** as the Sample Type and select **OK**. Aspirate a saline primer to verify that background counts in the sample pathway are within acceptable limits. Make sure that **Primer** displays on the status line before aspiration.

7. If background counts are acceptable, proceed to step 8. If not, perform one aspiration of a 25% bleach solution followed by three aspirations of distilled water or saline, and repeat steps 5 and 6.

8. Select the correct sample type and then enter the sample or control information in the Manual Sample ID box or scan the barcode on the sample tube. Do not use sample barcode labels with selectivities encoded in them to enter sample identifications.

 CAUTION: Make sure the correct sample ID and sample type appears on the status line before aspirating a sample using the manual open-tube sampler.

9. After appropriate incubation, mix the sample again, either by inverting it 5-10 times or by vortexing it for 5 seconds immediately before aspiration on the ADVIA 120 Hematology System. Cells in prepared CSF samples will settle quickly due to low viscosity.

10. Aspirate the sample.

a. Position tube so that the sample probe is immersed into the well-mixed sample. The sample probe should not contact test tube surface, which could block the free flow of sample into the probe.

b. Press the aspirate plate. The sampling light flashes during aspiration. Complete sample aspiration takes approximately 6 seconds and will consume almost the entire prepared sample. Do not remove sample until sampling light has stopped flashing. There is no Probe Clog message to indicate incomplete sample aspiration in the CSF mode. Carefully observe the sample during aspiration to ensure that the sample probe is below the surface of the sample during the entire aspiration.

c. When the sampling light stops flashing, remove the tube.

11. When the analysis of *all* CSF samples is complete and you would like to return to whole-blood operation, select **Exit**. The system automatically returns to the Whole Blood Manual Sample ID window.

 When you exit CSF operation after running at least one sample or any cycle, the system asks if you are sure you want to exit. Select **OK** to leave the Cerebrospinal Fluid (CSF) window. Select **Cancel** to keep using the CSF features.

 NOTE: If any samples were processed or cycles run in the CSF mode, the system will perform a hydraulic exit cycle. If no samples or cycles were run in CSF mode, the system simply exits CSF mode.

Tip

If a system left in CSF mode has made the transition to Standby and you want to exit CSF mode to run whole-blood samples, switch to whole-blood operation *before* exiting standby. This will reduce unnecessary reagent use.

Quality Control

Quality control of the CSF Assay is performed using ADVIA 120 TESTpoint CSF Controls containing one each of Level 1 and Level 2 controls. These controls are intended to be integrated into a clinical laboratory's own quality control program and procedures. Follow the package insert instructions for assaying the control products.

REF	Product Number	Symbol	Contents	Amount (mL)
00872863	T03-4485-01		CSF Controls	2 x 3 mL
-	T03-4486-01	CONTROL CSF 1	Control Level 1	3 mL
-	T03-4487-01	CONTROL CSF 2	Control Level 2	3 mL

Control materials should be assayed:

- At the beginning of each shift or at some other interval chosen by the laboratory.
- After a reagent lot number change.

- After replacement of any part or component of the analytical module that may affect analytical performance.

NOTE: Moving Average calculations are not available for CSF results.

Results

The system automatically performs all calculations necessary for obtaining results for undiluted samples (samples prepared 1:1 with CSF reagent) and displays them on the Run Screen.

ADVIA 2120/2120i results should be reviewed for conditions listed in the Limitations of the Procedure. If a sample displays any of the listed conditions, the results should be confirmed.

The results of samples that have been diluted with PBS or normal saline prior to preparation with CSF reagent must be corrected for the dilution factor. If a sample is diluted, the absolute counts should be multiplied by the dilution factor. Enter the dilution factor in the Dil. field of the Order Entry tab when creating the workorder. The results displayed in the Review \ Edit tab and printed on the final patient report will be automatically corrected by the entered dilution factor. For example, if a sample is diluted 1:5 (1 part sample and 4 parts normal saline or PBS), the absolute counts will be multiplied by 5. The differential percentages are not affected by dilution, and will not be multiplied by the dilution factor when correcting on the Review \ Edit tab. Results on the Run Screen are not corrected for the dilution factor.

The Laser Power Low (PL) system flag is enabled for CSF analysis.

High/Low flagging is provided for all CSF parameters through range definitions set in the Data Manager.

Limitations of the Procedure

The limitations of the procedure are as listed:

1. CSF WBC percent differential results for samples with WBC counts less than 20 cells/µL should be confirmed using an alternate method.
2. The ADVIA 120 CSF Assay can accurately analyze samples with up to 1500 RBC/µL. Samples that are suspected of containing greater than 1500 RBC/µL may be diluted up to 1:10 with PBS.
3. The ADVIA 2120/2120i Hematology System provides no morphology flagging to indicate the presence of abnormal cells in the CSF Assay. Only High / Low flagging and the Laser Power Low system flag are enabled for the CSF Assay.
4. Improper sample handling or failure to review CSF cytograms for possible interferences/analysis artifacts may produce erroneous results. Examples of improper sample handling include, but are not limited to:
 - ♦ Inadequate mixing of CSF patient sample or prepared sample before aspiration on the ADVIA 120

- ♦ Incomplete sample aspiration on the ADVIA 120
- ♦ Incomplete incubation time

- Samples with total protein content 500 – 1000 mg/dL should be analyzed within 1 hour after preparation with CSF reagent. Increased protein concentrations may cause precipitation of cells and proteins in the prepared sample.
- The ADVIA 120 CSF RBC count provides no information to distinguish between elevated CSF RBC counts due to cerebral hemorrhage or traumatic spinal tap.

Interfering Substances

- Samples containing oily or fatty contaminants may interfere with the ADVIA 120 cell counts. Avoid oily contaminants, such as silicon used to lubricate the stoppers of blood collection tubes.
- RBC coincidence events in samples with RBC counts greater than 1500 cells/µL may cause falsely elevated CSF WBC counts and incorrect CSF WBC differentials. Such a sample should be diluted to acceptable RBC limits in PBS before preparation with CSF Reagent and reanalyzed.
- RBCs in samples that have been diluted with normal saline before preparation with CSF reagent require a longer incubation period to sphere the RBCs in the sample. The preferred diluent for CSF samples is PBS. Samples diluted with normal saline must be prepared with CSF reagent immediately after dilution and must be incubated for 10 minutes in order to allow complete RBC sphering.
- Samples containing microcytic and/or hypochromic RBC populations may falsely decrease the CSF RBC count.
- Samples containing RBC populations that fail to sphere completely may give falsely elevated CSF WBC counts and incorrect CSF WBC Differentials.
- Budding yeast forms may overlay both CSF RBC and CSF WBC counting areas, falsely elevating CSF RBC and WBC counts.

Expected Values

The range of expected values for the CSF Assay can vary depending on patient age or other patient characteristics. It is recommended that each laboratory establish its own range of expected values based on their patient population. The following range of expected values is based on ADVIA 120 results from 52 CSF specimens that were determined to be normal by manual methods.

Parameter	Expected Value
WBC (cells/µL)	0-10
MN (cells/µL)	0-10

Parameter	Expected Value
PMN (cells/μL)	0-4

Performance Characteristics: Precision

Within run precision on the ADVIA 120 CSF Assay was evaluated by performing replicate aspirations of 16 CSF patient samples with adequate volume. Volume permitting, CSF samples were aspirated 2–10 times. Results from the 16 samples were pooled giving a total sample size of n=65.

Precision of CSF WBC Counts (n=65)

Parameter	Mean	SD	CV
WBC	44.6	5.0	11.2

Precision of CSF RBC Counts (n=65)

Parameter	Mean	SD	CV
RBC	12.9	4.1	31.7

Precision of CSF WBC Differential (n=65)

Parameter	Mean	SD	CV
% Neut	12.5	3.2	25.5
% Lymph	74.9	5.1	6.9
% Mono	8.3	3.2	39.3
% MN	83.2	3.6	4.3
% PMN	16.8	3.6	21.2
# Neut	4.8	1.1	23.6
# Lymph	33.8	4.0	11.7
# Mono	4.1	1.2	30.1
# MN	37.9	4.7	12.4
# PMN	6.6	2.0	29.9

Performance Characteristics: Accuracy

The accuracy of the CSF WBC count was evaluated by comparing manual counts from 90 samples to counts from the ADVIA 120 Hematology System. Accuracy statistics are found in the tables below.

CSF WBC Count

The accuracy of the CSF WBC count was evaluated by comparing manual counts from 90 samples to counts from the ADVIA 120 Hematology System. Accuracy statistics are found in the table below.

R	Slope	Intercept	Syx	Manual Mean	ADVIA 120 Mean	Bias
0.981	1.38	2	14	20	30	10

CSF RBC Count

The accuracy of the CSF RBC count was evaluated by comparing manual counts from 78 CSF patient samples to counts from the ADVIA 120 Hematology System. Accuracy statistics are found in the table below.

R	Slope	Intercept	Syx	Manual Mean	ADVIA 120 Mean	Bias
0.989	1.18	-19	481	551	628	77

Absolute CSF WBC Differential

The accuracy of the CSF absolute WBC differential was evaluated by comparing manual counts from 50 CSF patient samples to counts from the ADVIA 120 Hematology System. Accuracy statistics are found in the table below.

Parameter	R	Slope	Intercept	Syx	Manual Mean	ADVIA 120 Mean	Bias
# MN	0.896	1.07	4	8	9	14	5
# PMN	0.973	1.24	0	11	10	12	2
# Neut	0.971	1.22	0	11	10	12	2
# Lymph	0.859	0.88	4	7	10	8	-2
# Mono	0.849	1.69	1	4	1	4	3

CSF WBC Differential Relative Percentages

The accuracy of the CSF WBC Differential relative percentages was evaluated by comparing manual counts from 50 CSF patient samples to counts from the ADVIA 120 Hematology System. The WBC differential relative percentages were analyzed by paired t-test and Rümke analysis as recommended in CLSI Document M29-A3. The results below give a p-value for the paired t-test and the percentage of results falling within the binomial limits.

Parameter	Manual Mean	ADVIA 120 Mean	t-test p-value	% Within Binomial Limit
% MN	72.7	72.2	0.992	100%
% PMN	26.9	25.6	0.800	100%
% Neut	26.6	22.3	0.383	98%
% Lymph	63.2	54.6	0.088	96%
% Mono	9.5	17.6	0.15	96%

Performance Characteristics: Carryover

Because of the low number of cells counted in CSF analysis, the ADVIA 120 hydraulic cycles were designed to eliminate carryover when assaying CSF samples. Prior to assaying each CSF sample, the ADVIA120 rinses all reagent and sample pathways in preparation for the next sample. Carryover for the CSF Assay was evaluated by measuring multiple assays of a highly cellular sample followed by a low cellular sample. The observed carryover was less than 1%, where carryover is expressed as the average percentage of the high level sample that is lost to the trailing low level sample.

Performance Characteristics: Analytical Range

The analytical range for CSF WBC and RBC counts was established by making serial dilutions of samples prepared to have low analyte values. The dilution studies show that the CSF WBC count is accurate to 5 cells/µL over the range 0–50 cells/µL and accurate to 10% over the range 50–5,000 cells/µL. The CSF RBC count is accurate to 5 cells/µL over the range 0–50 cells/µL and accurate to 10% over the range 50-2880 cells/µL. The results from the study are found in the tables below.

CSF WBC Low Level Linearity

Pool (% of reference level)	Observed WBC	Expected WBC	Absolute Deviation	% Deviation
0.00%	0	0	0	
0.05%	2	3	-1	
0.1%	5	5	0	
0.2%	10	10	0	
1.0%	53	50	3	
10.0%	514	501	13	3
100% (reference level)	5009	5009	0	0

CSF RBC Low Level Linearity

Pool (% of reference level)	Observed RBC	Expected RBC	Absolute Deviation	% Deviation
0.00%	0	0	0	
0.05%	2	1	1	
0.1%	4	3	1	
0.2%	9	6	3	
1.0%	34	29	5	
10.0%	308	288	20	7
100% (reference level)	2880	2880	0	0

NOTE: Although RBC linearity has been demonstrated up to 2880 RBC/µL, samples with greater than 1500 RBC/µL should be diluted to ensure the accuracy of the white count.

WBC DIFF Method

Intended Use

The ADVIA 2120/2120i Hematology System White Blood Cell Differential (**WBC DIFF**) methods, consisting of both the Peroxidase method and the Basophil/Lobularity method, are intended to quantitatively measure the following WBC hematological parameters:

Neutrophils: percentage of WBC (%NEUT) and absolute count (#NEUT)

Lymphocytes: percentage of WBC (%LYMPH) and absolute count (#LYMPH)

Monocytes: percentage of WBC (%MONO) and absolute count (#MONO)

Eosinophils: percentage of WBC (%EOS) and absolute count (#EOS)

Large Unstained Cells: percentage of WBC (%LUC) and absolute count (#LUC)

Basophils: percentage of WBC (%BASO) and absolute count (#BASO)

Principles of the Procedure

Peroxidase Method

The peroxidase method was developed by Cremins, Kim, Malin, and Sclafani, based on the principles of differential cellular staining outlined by Ansley and Ornstein. According to these principles, leukocytes are classified by the characteristic properties exhibited by cell-specific constituents when the cells are treated with cytochemical stains. The enzyme peroxidase is present and active in several leukocyte types. In the presence of hydrogen peroxide and an appropriate electron acceptor chromogen, peroxidase develops a darkly colored material which precipitates in the cells. Normal neutrophils and eosinophils possess significant levels of peroxidase activity, with enzyme activity corresponding to cell maturation.

The monocytes were demonstrated to contain lower amounts of peroxidase, which made it possible to define them as a cell population with relatively large light-scatter signals and absorption signals that extend from the unstained cells up to, and partly overlapping, the most weakly-stained neutrophils.

The lymphocyte population analyzed with the Peroxidase Method contains both lymphocytes and basophils. The basophil count (obtained from the Basophil/Lobularity method) is subtracted from the lymphocyte population to obtain the lymphocyte count.

The peroxidase cytochemical reaction consists of 2 steps. In the first step, EDTA anticoagulated whole-blood sample is diluted with ADVIA 120 PEROX 1 reagent. Surfactants and thermal stress cause lysis of the red blood cells. Formaldehyde in ADVIA 120 PEROX 1 reagent fixes the white blood cells.

During the second step, ADVIA 120 PEROX 2 reagent and ADVIA 120 PEROX 3 reagent are added to the peroxidase reaction chamber. The 4-chloro-1-naphthol in ADVIA 120 PEROX 2 reagent and the hydrogen peroxide in ADVIA 120 PEROX 3 reagent stain the sites of peroxidase activity in the granules of neutrophils, eosinophils, and monocytes. Lymphocytes, basophils, and large unstained cells contain no granules with peroxidase enzyme activity.

A constant volume of the cell suspension from the Perox reaction chamber passes through the flowcell. The two fluids flow as independent, concentric streams (no mixing), with the ADVIA 120 PEROX SHEATH stream encasing the sample stream. The absorbance and the forward light-scattering signatures of each blood cell are measured. The optical signals are converted to electrical pulses by photodiodes. After processing, the information is displayed in two histograms. The Perox Y histogram contains the forward-scattering data (cell size). The Perox X histogram contains the absorption data (peroxidase staining). The two histograms are combined to form the Perox cytogram from which cells are identified and counted.

Bibliography

Cremins J, et al: Method for the determination of differential white blood cell count. US Patent 4,801,549

Ansley H and Ornstein L: Enzyme histochemistry and differential white cells on the Technicon Hemalog D. In: Advances in Automated Analysis, Technicon International Congress 1970, Volume 1. Therman Associates, Miami, FL, p 437 (1971)

Saunders AM: Hemalog D system - recent development. In: Advances in Automated Analysis, Technicon International Congress 1972, Volume 3. Mediad Inc., Tarrytown, NY, pp 27-32 (1973)

Groner W, et al: Peroxidase activity of human monocytes as a function of pH and fixation observed with the Hemalog D. Presented at ACHE II (2nd workshop of the Automated Cytochemistry and Hematology Exchange), Marlow-on-Thames, England, May 22-23 (1980)

Basophil / Lobularity Method

The Basophil/Lobularity method was developed by Cremins and Orlik to provide both accurate basophil counts and a measure of cellular lobularity.

This method provides precise, accurate, and rapid recognition of basophils. Cremins and Orlik discovered that basophils are particularly resistant to lysis by a combination of acid and surfactant.

When the EDTA anticoagulated whole blood sample is mixed with ADVIA 120 BASO reagent, the red blood cells are hemolyzed and the cytoplasm is stripped from all white cells except basophils. The sample is then analyzed by two-angle laser light scattering detection using a laser diode. The white cells are classified into three categories: basophils, mononuclear (MN) cells, and polymorphonuclear (PMN) cells.

Bibliography

Cremins J and Orlik J: Leukocyte differential method. US Patent 5,518,928 (1996)

Reagents

The following ready-to-use reagents are required to perform the DIFF methods and maintain the ADVIA 2120/2120i Hematology System:

DIFF TIMEPAC

REF	Product Number	Symbol	Contents	Amount (mL)
00739500	T01-3621-52		DIFF TIMEPAC	
-	T01-3630-01	PEROX 1	PEROX 1	2 x 650 mL
-	T01-3631-01	PEROX 2	PEROX 2	2 x 305 mL
-	T01-3632-01	PEROX 3	PEROX 3	2 x 585 mL
-	T01-3633-01	PEROX SHEATH	PEROX SHEATH	2 x 2725 mL

ADVIA 120 BASO

REF	Product Number	Symbol	Contents	Amount (mL)
-	T01-3629-01	BASO	BASO	2 x 1100 mL

ADVIA 120 SHEATH/RINSE

REF	Product Number	Symbol	Contents	Amount (L)
02337140	T01-3664-01	SHEATH/RINSE	SHEATH/RINSE	10 L
01554628	T01-3623-01	SHEATH/RINSE	SHEATH/RINSE	20 L

ADVIA 120 PEROX 1

(Prod. No. T01-3630-01) 2 x 650 mL

ADVIA 120 PEROX 1 contains:

Sodium dodecyl sulfate, 0.36 mmol/L

Sorbitol, 620 mmol/L

Sodium chloride, 8.35 mmol/L

Formaldehyde, 5.7%

BRIJ-35, 0.100 mmol/L

Buffer



HARMFUL!

R20/21/22, R36/37/38, R40, R43
S26, S36/37, S45, S51

Contains formaldehyde. Potential cancer hazard. Harmful by inhalation, in contact with skin, and if swallowed. Irritating to eyes, respiratory system, and skin. Possible risk of irreversible effects. May cause sensitization by skin contact. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves. In case of accident, or if you feel unwell, seek medical advice immediately (show label where possible). Use only in well-ventilated areas.

For *in vitro* diagnostic use.

ADVIA 120 PEROX 2

(PN T01-3631-01) 2 x 305 mL

ADVIA 120 PEROX 2 contains:

4-Chloro-1-naphthol, 44.8 mmol/L

Diethylene glycol, 99.2%

For *in vitro* diagnostic use.

ADVIA 120 PEROX 3

(PN T01-3632-01) 2 x 585 mL

ADVIA 120 PEROX 3 contains:

Stabilizer

Hydrogen peroxide, 0.3%

For *in vitro* diagnostic use.

ADVIA 120 PEROX SHEATH

(PN T01-3633-01) 2 x 2725 mL

ADVIA 120 PEROX SHEATH contains:

Propylene glycol, 4.06 mol/L

Surfactant

For *in vitro* diagnostic use.

PEROX SHEATH is also available separately.

REF	Product Number	Symbol	Contents	Amount (mL)
03624240	T01-3633-54	PEROX SHEATH	PEROX SHEATH	4 x 2725 mL

Storage and Stability

Reagents

When stored between 15°C and 30°C:

- All unopened reagents are stable until the expiration date printed on the product label.
- Opened containers of the ADVIA 120 BASO, ADVIA 120 PEROX 1, ADVIA 120 PEROX 2, ADVIA 120 PEROX 3, and ADVIA 120 PEROX SHEATH reagents are stable for 90 days.

Calibrators and Controls

Protect product from freezing.

When stored at 2°C to 8°C, unopened ADVIA OPTIpoint (Prod. No. T03-3682-01), ADVIA SETpoint Calibrator (PN T03-3685-01), and ADVIA TESTpoint Hematology Controls (PN T03-3686-01, Low; T03-3687-01, Normal; and T03-3688-01, High, respectively) are stable until the last day of the month of the expiration date printed on the product label unless stated otherwise.

After being opened, ADVIA OPTIpoint is stable for 7 days, ADVIA TESTpoint Hematology Controls are stable for 10 days, and the ADVIA SETpoint Calibrator is stable for 5 days, when stored closed in their original containers at 2°C to 8°C.

Gain Adjustment

The gain adjustment procedure is used to adjust the amplification signals in a channel to properly position the cell signatures within a cytogram.

Calibration

The system must be calibrated for all parameters except %RETIC. Siemens recommends the use of ADVIA SETpoint Calibrator (Prod. No. T03-3685-01). Please refer to page 5 for product descriptions.

Calibration procedure should be performed:

- Upon installation of the system.
- If there is a significant shift in control values after the replacement of a critical hardware component or reagent lot, after checking gains.
- Anytime control results and/or moving averages are out of range and it has been verified that the out-of-control condition is instrument-related.

Sample Handling

Sample Collection

Collect whole blood in an evacuated blood collection tube containing EDTA as an anticoagulant. Blood samples should be refrigerated at a temperature from 2°C to 8°C, if they will not be analyzed within eight (8) hours of phlebotomy. If a specimen has been refrigerated, allow it to equilibrate slowly to room temperature (15°C to 30°C) before analysis.

Sample Dilution

Whole-blood specimens with values exceeding the analytical range may be diluted with autologous plasma or isotonic saline and reassayed.

Sample Stability

The effect of the aging of blood was studied over a 72 hour period on the ADVIA 120 Hematology System.

Two whole-blood specimens drawn from 15 normal, apparently healthy donors were assayed shortly after phlebotomy and then again at intervals of 8, 24, 36, 48, 56, and 72 hours.

One of the whole-blood specimens from each pair was stored at room temperature while the corresponding specimen was stored at 2°C to 8°C in capped blood collection tubes that contained EDTA as the anticoagulant.

The results indicate that WBC DIFF parameters are stable within 2 standard deviations (within run precision) of the initial recovery for the specified time interval.

Parameter	Room Temperature Stability (hours)	Refrigerated Temperature Stability (hours)
%NEUT	36	72
%LYMPH	36	72
%MONO	72	72
%EOS	8	72
%BASO	72	56
%LUC	72	72

Materials Required but not Provided

For the ADVIA 2120/2120i Hematology System, the other materials required to perform the ADVIA 120 WBC DIFF method are the various control materials, calibrators, ADVIA OPTIpoint, and other reagents or equipment specified in the "Methods Introduction" section.

Procedure

To run samples on your ADVIA 2120/2120i Hematology system, refer to the Daily Routine.

Quality Control

It is recommended that the system be controlled using ADVIA TESTpoint Hematology Controls. Please refer to page 9-5 for product descriptions. These controls are intended to be integrated into a clinical laboratory's own quality control program and procedures.

Control materials should be assayed:

- At the beginning of each shift or at some other interval chosen by the laboratory.
- After a reagent lot number change.
- After replacement of any part or component of the analytical module that may affect analytical performance.

As an option, laboratories may run a retained patient sample periodically to monitor performance trends.

Results

The system automatically performs all calculations necessary for obtaining final results.

Through the use of complex flagging algorithms, laboratory personnel are alerted to suspected abnormal conditions. These conditions are indicated by the appropriate flag (such as *, +, and/or color highlighting). Whenever flags occur, the user should review the results and take appropriate action.

Limitations of the Procedure

The limitations of the procedure are as listed:

1. Certain abnormal specimens such as those from hemodialysis patients, patient specimens with nucleated RBCs (particularly neonates), as well as specimens exhibiting platelet clumping or incomplete lysis of RBCs, may interfere with white cell differential.
2. Circulating micromegakaryocytes may be counted as white blood cells.
3. Incomplete RBC lysis in the Peroxidase channel may be observed in specimens with elevated serum urea nitrogen (BUN > 75 mg/dL).
4. Interference with the performance of the Peroxidase channel may be noted in specimens obtained from patients with inherited or acquired deficiency of the myeloperoxidase enzyme. Such deficiency has been observed in approximately 0.5% of laboratory specimens.

5. In certain abnormal specimens (specifically lymphoid disorders and leukemias), erroneously elevated basophil counts may be observed.

Expected Values

The range of expected values can vary depending on age, sex, diet, and location. It is recommended that each laboratory establish its own range of expected values.

The following range of expected values is based upon the duplicate assay of 60 whole-blood specimens obtained from an adult population of assumed healthy individuals.

Parameter	Low Value	High Value
%NEUT	40	77
%LYMPH	16	44
%MONO	4	9
%EOS	1	7
%BASO	0	1
%LUC	1	4

NOTE: Because of numerical rounding, the Diff results should total 100% ± 0.2%, except when %BASO is >5% and the Baso Count Suspect (B-SUSP, BC) flag is triggered. In cases where the total is greater than 100% ± 0.2%, the amount in excess of 100% is due to %BASO.

Performance Characteristics: Imprecision

A total of 18 runs were performed using multiple samples.

The following estimates of imprecision were obtained by taking 25 aspirations from each whole-blood sample. Each of the sample selectivity modes was tested by sampling from opened tubes and with the manual and automated closed-tube samplers.

Parameter	Mean	Standard Deviation	CV (%)
%NEUT	55.0	0.9	1.6
%LYMPH	31.3	0.9	2.9
%MONO	7.2	0.5	6.9
%EOS	3.4	0.3	8.8
%BASO	0.5	0.1	20.0
%LUC	2.5	0.4	16.0

Performance Characteristics: Correlation Data

The performance of the ADVIA 120 Hematology System was compared with the performance of the Technicon H•3 RTC System (x) using whole blood from 60 normal donors and 70 hospital donors with each sample run in duplicate (n = 260).

The following regression statistics were computed using a protocol similar to that recommended in the NCCLS document EP9-A, *Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline (1995).*

Parameter	Comparative System or Method	Regression Equation (y=)	r	Sy.x
%NEUT	Technicon H•3 RTC	1.02x - 0.6	0.997	1.6
%LYMPH	Technicon H•3 RTC	1.00x + 0.8	0.997	1.7
%MONO	Technicon H•3 RTC	0.85x - 0.3	0.943	0.8
%EOS	Technicon H•3 RTC	0.87x + 0.2	0.979	0.4
%BASO	Technicon H•3 RTC	0.67x + 0.0	0.772	0.2
%LUC	Technicon H•3 RTC	0.92x + 0.6	0.944	0.7

x = Technicon H•3 RTC system

y = ADVIA 120 Hematology system

Reticulocyte Method

Intended Use

The ADVIA 2120/2120i Hematology System Reticulocyte Count (RETIC) method is intended to quantitatively measure the following reticulocyte parameters:

- Reticulocyte concentration (#RETIC)
- Reticulocyte percentage (%RETIC)
- Reticulocyte Cell Hemoglobin Content (CHr)

Principles of the Procedure

Reticulocyte Cell Count

Historically, reticulocytes have been assayed by manual methods via the microscope, in conjunction with nucleic acid stains such as new methylene blue and brilliant cresyl blue. This method uses a nucleic acid dye (oxazine 750) to stain cellular RNA.

Two microliters (2 µL) of an EDTA anticoagulated whole-blood sample are mixed online with the ADVIA 120 autoRETIC reagent. The ADVIA 120 autoRETIC reagent isovolumetrically spheres the erythroid cells and stains cellular RNA. Low-angle laser light scatter, high-angle laser light scatter, and absorption characteristics of all cells are counted and measured. The absorption data are used to classify each cell as a reticulocyte or mature red blood cell based on its RNA content.

Reticulocyte Size

The method of sizing reticulocytes uses the simultaneous measurement of laser light scattered at two (2) different angular intervals, which eliminates the adverse effect of variation in cellular hemoglobin concentration on the determination of the MCVr parameter.

CHr

The CHr is the mean of cellular hemoglobin content (CH) histogram for the reticulocyte population.

CHr has been shown to be an early indicator of functional iron deficiency. Functional iron deficiency has been shown to occur when erythropoietin (rHuEPO) is employed in the treatment of anemia associated with end stage renal failure and other diseases. Traditional methods for the detection of iron deficiency have been shown not to be as sensitive and specific in the detection of functional iron deficiency.

By providing a direct measure of the hemoglobin content of reticulocytes, the CHr Assay gives health care professionals a new sensitive tool for the early detection of functional iron deficiency and provides additional information that can be used in managing the iron requirements for rHuEPO therapy.

Bibliography

Savage RA, Skoog DD, and Rabinovich A: Analytical inaccuracy and imprecision in reticulocyte counting: A preliminary report from the College of American Pathologist's reticulocyte project. *Blood Cells* **11**:97-112 (1985)

Brugnara C, Colella G, Cremins J, Langley R, Schneider T, Rutherford C, Goldberg M.: Effects of subcutaneous recombinant human erythropoietin in normal subjects: Development of decreased reticulocyte hemoglobin content and iron-deficient erythropoiesis. *J Lab Clin Med* **123**:660-667 (1994)

Fishbane S, *et al*: Reticulocyte hemoglobin content in the evaluation of iron status in hemodialysis patients. *Kidney Intl* **52**:217-222 (1997)

Reagents

The following ready-to-use reagents are required to perform the Reticulocyte method and maintain the ADVIA 2120/2120i Hematology System:

ADVIA 120 autoRETIC

ADVIA 120 SHEATH/RINSE

ADVIA 120 EZ KLEEN

ADVIA 120 DEFOAMER

ADVIA 120 autoRETIC

REF	Product Number	Contents	Amount (mL)
04296794	T01-3622-54	autoRETIC	4 x 820 mL
-	T01-3622-01	autoRETIC	820 mL

ADVIA 120 autoRETIC contains:

Oxazine 750, 11.4 mg/L

Buffer

N-Tetradecyl-N,N-dimethyl-3-ammonio-1-propane sulfonate, 0.023 mmol/L

N,N-dimethylformamide, 0.38%

For *in vitro* diagnostic use.

ADVIA 120 EZ KLEEN

REF	Product Number	Symbol	Contents	Amount (mL)
05101601	T01-3624-54	EZ KLEEN	EZ KLEEN	4 x 810 mL
-	T01-3624-01	EZ KLEEN	EZ KLEEN	810 mL

As formulated contains:

Sodium hydroxide, 50 mmol/L

2-(2-Ethoxyethoxy)ethanol, 894 mmol/L

Surfactant

For *in vitro* diagnostic use.

For a product description of SHEATH/RINSE, please refer to page 25. For a product description of DEFOAMER, please refer to page 24.

Storage and Stability

Reagents

When stored between 15°C and 30°C:

- All unopened reagents are stable until the expiration date printed on the product label.
- Opened containers of the ADVIA 120 autoRETIC reagent are stable for 120 days.
- Opened containers of ADVIA 120 SHEATH/RINSE are stable for 45 days.
- Opened containers of ADVIA 120 EZ KLEEN and DEFOAMER are stable for 90 days.

Calibrators and Controls

ADVIA 120 RETIC Control High

REF	Product Number	Symbol	Contents	Amount (mL)
09091295	T03-3691-54	CONTROL RETIC HIGH	Reticulocyte Control High	4 x 4.0 mL
-	T03-3691-01	CONTROL RETIC HIGH	Hematology Control High	4.0 mL

ADVIA 120 RETIC Control Low

REF	Product Number	Symbol	Contents	Amount (mL)
08773805	T03-3690-54	CONTROL RETIC LOW	Reticulocyte Control Low	4 x 4.0 mL

REF	Product Number	Symbol	Contents	Amount (mL)
-	T03-3690-01	CONTROL RETIC LOW	Reticulocyte Control Low	4.0 mL

Protect product from freezing.

When stored at 2°C to 8°C, unopened ADVIA OPTIpoint (Prod. No. T03-3682-01), ADVIA SETpoint Calibrator (Prod. No. T03-3685-01), and ADVIA TESTpoint Reticulocyte Controls (Prod. No. T03-3690-01, Low; and T03-3691-01, High, respectively) are stable until the last day of the month (expiration date) printed on the product label, unless otherwise stated.

After being opened, ADVIA OPTIpoint is stable for 7 days, ADVIA TESTpoint Reticulocyte Controls are stable for 10 days and the ADVIA SETpoint Calibrator is stable for 5 days, when stored closed in their original containers at 2°C to 8°C.

Gain Adjustment

The gain adjustment procedure is used to adjust the amplification signals in a channel to properly position the cell signatures within a cytogram.

Calibration

The system must be calibrated for all parameters except %RETIC. Properly setting the RETIC gain factor provides sufficient accuracy of the %RETIC result for most laboratories. In such cases, do not change the factory-set %RETIC calibration factor of 1.00.

However, laboratories using a manual counting method other than those recommended by NCCLS or ICSH, or laboratories using certain flow cytometric methods, could observe a significant bias when comparing to the ADVIA 2120/2120i Hematology system method. In this event, use the calibration procedure to obtain agreement with the other method.

Calibration procedure should be performed:

- Upon installation of the system.
- If there is a significant shift in control values after the replacement of a critical hardware component or reagent lot, after checking gains.
- Anytime control results and/or moving averages are out of range and it has been verified that the out-of-control condition is instrument-related.

Sample Handling

Sample Collection

Collect whole blood in an evacuated blood collection tube containing EDTA as an anticoagulant. Blood samples should be refrigerated at a temperature from 2°C to 8°C, if they will not be analyzed within eight (8) hours of phlebotomy. If a specimen has been refrigerated, allow it to equilibrate slowly to room temperature (15°C to 30°C) before mixing.

Sample Dilution

Dilution of whole-blood specimens for RETIC analysis is not recommended.

Sample Stability

The effect of the aging of blood was studied over a 72-hour period on the ADVIA 120 Hematology System.

Two whole-blood specimens drawn from 15 normal, apparently healthy donors were assayed shortly after phlebotomy and then again at intervals of 8, 24, 36, 48, 56, and 72 hours.

One of the whole blood specimens from each pair was stored at room temperature while the corresponding specimen was stored at 2°C to 8°C in capped blood collection tubes that contained EDTA as the anticoagulant.

The results indicate that RETIC parameters are stable within 2 standard deviations (within run precision) of the initial recovery for the specified time interval. The stability of calculated parameters is limited to the stability of the least stable primary parameter.

Parameter	Room Temperature Stability (hours)	Refrigerated Temperature Stability (hours)
%RETIC	24	72
CHr	24	72

Materials Required but not Provided

For the ADVIA 2120/2120i Hematology System, the other materials required to perform the ADVIA 120 reticulocyte method are the various control materials, calibrators, ADVIA OPTIpoint, and other reagents or equipment specified in the "Methods Introduction" section.

Procedure

To run samples on your ADVIA 2120/2120i Hematology System, refer to the Daily Routine.

Quality Control

It is recommended that the system be controlled using ADVIA TESTpoint Reticulocyte Controls. These controls are intended to be integrated into a clinical laboratory's own quality control program and procedures.

Control materials should be assayed:

- At the beginning of each shift or at some other interval chosen by the laboratory.
- After a reagent lot number change.
- After replacement of any part or component of the analytical module that may affect analytical performance.

As an option, laboratories may run a retained patient sample periodically to monitor performance trends.

Results

The system automatically performs all calculations necessary for obtaining final results.

Through the use of complex flagging algorithms, laboratory personnel are alerted to suspected abnormal conditions. These conditions are indicated by the appropriate flag (such as *, +, and/or color highlighting). Whenever flags occur, the user should review the results and take appropriate action.

Limitations of the Procedure

The limitations of the procedure are as listed:

1. When assaying samples with extremely elevated counts, the reticulocyte method may give reticulocyte counts that differ significantly from NCCLS manual counts. Extremely elevated counts are often seen in samples that contain sickled cells or nucleated RBCs.
2. Samples from patients having the following cell types or conditions may interfere with the ADVIA 120 Reticulocyte method:

 Malarial parasites

 Pappenheimer Bodies

 Howell-Jolly Bodies

 Heinz Bodies

 Inclusions that give rise to basophilic stipling

 Macrothrombocytes (giant platelets)

 Megaloblastic anemia

 Other rare, poorly characterized red cell anomalies

Expected Values

The range of expected values can vary depending on age, sex, diet, and location. It is recommended that each laboratory establish its own range of expected values.

The following range of expected values is based upon the duplicate assay of 60 whole blood specimens obtained from an adult population of assumed healthy individuals.

Parameter	Low Value	High Value
#RETIC (10^9/L)	40	79
%RETIC	0.8	2.1
CHr (pg)	24	36

Performance Characteristics: Imprecision

A total of 18 runs were performed using multiple samples.

The following estimates of imprecision were obtained by taking 25 aspirations from each whole-blood sample. Each of the sample selectivity modes was tested by sampling from opened tubes, and with the manual and automated closed-tube samplers.

Parameter	Mean	Standard Deviation	CV (%)
#RETIC (10^9/L)	57.8	7.7	13.3
%RETIC	1.2	0.16	13.3
CHr (pg)	28.9	0.2	0.7

Performance Characteristics: Correlation Data

The performance of the ADVIA 120 Hematology System was compared with the performance of the Technicon H•3 RTC System (x) using whole blood from 60 normal donors and 70 hospital donors with each sample run in duplicate (n = 260).

The following regression statistics were computed using a protocol similar to that recommended in the NCCLS document EP9-A, *Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline* (1995).

Parameter	Comparative System or Method	Regression Equation (y=)	r	Sy.x
#RETIC (10^9/L)	Technicon H•3 RTC	0.79x + 7.8	0.903	13.6
%RETIC	Technicon H•3 RTC	0.82x + 0.2	0.925	0.4
CHr (pg)	Technicon H•3 RTC	0.96x + 4.2	0.940	1.7

x = Technicon H•3 RTC system

y = ADVIA 120 Hematology system

Performance Characteristics: Carryover

Sample carryover for the ADVIA 2120/2120i Hematology System is expressed as the percentage of a high-level sample lost to a trailing low-level sample. Carryover was determined for the RBC count obtained from the reticulocyte channel (RTC RBC).

Parameter	Observed Carryover
RTC RBC	1.0%

Performance Characteristics: Analytical Range

The analytical range for %RETIC parameter is:

Parameter	Range Evaluated	Maximum Observed Deviation
%RETIC	0.2 - 24.9	2.6

Method Data Summary

CBC Method Data

The sample stability, expected ranges, and performance characteristics for the CBC method are listed in the following Table.

	Sample Stability		Expected	Imprecision			Correlation Data			Observed	Analytical Range	
	Room Temp	Refrigerated	Values	Mean	SD	CV%	y=	r	Sy.x	Carryover	Range	Deviation
WBC (10^3/µL)	36 h	56 h	3.8 to 8.6	5.91	0.16	2.7	1.06x - 0.74	0.997	1.42	0.4%	0.02 to 21.83 20.48 to 409.55	0.46 x 10^3/µL 4.1 %
RBC (10^6/µL)	48 h	72 h	4.1 to 6.0	4.82	0.05	1.0	0.98x + 0.11	0.997	0.07	0.2 %	0.0 to 2.65 2.65 to 6.76	0.03 x 10^6/µL 1.1 %
HGB (g/dL)	72 h	72 h	10 to 16	13.3	0.11	0.8	1.01x - 0.2	0.997	0.2	0.2 %	0.0 to 8.6 8.6 to 22.5	0.2 g/dL 2.5 %
MCV (fL)	8 h	24 h	76 to 100	81.0	0.3	0.4	0.90x + 9.6	0.994	1.1	★	★	★
CH (pg)	36 h	53 h	24 to 35	26.5	0.05	0.2	1.00x + 1.2	0.990	0.6	★	★	★
CHCM (g/dL)	8 h	24 h	29 to 34	30.6	0.14	0.5	1.17x - 6.5	0.974	0.5	★	★	★
RDW (%)	72 h	72 h	12 to 15	12.3	0.07	0.6	0.86x + 1.3	0.980	0.6	★	★	★
HDW (g/dL)	72 h	72 h	1.9 to 3.0	2.56	0.02	0.8	0.98x + 0.06	0.959	0.13	★	★	★
PLT (10^3/µL)	48 h	48 h	140 to 360	256	6.9	2.7	1.08x - 2.0	0.991	27	0.1 %	5 to 208 205 to 3983	10 x 10^3/µL 4.9 %
MPV (fL)	8 h	8 h	7 to 9	8.1	0.11	1.4	0.76x + 0.9	0.925	0.4	★	★	★
Hct (%)	★	★	33 to 57	★	★	★	★	★	n/a	★	★	★
MCH (pg)	n/a	n/a	24 to 31	n/a	n/a	n/a	n/a	n/a	n/a	★	★	★
MCHC (g/dL)	★	★	28 to 34	★	★	★	n/a	n/a	n/a	★	★	★

★ not available or not applicable for this parameter

x= Technicon H•3 RTC System y= ADVIA 120 Hematology System

WBC DIFF Method Data

The sample stability, expected ranges, and performance characteristics for the WBC DIFF method are listed in the following Table.

	Sample Stability		Expected	Imprecision			Correlation Data		
	Room Temp	Refrigerated	Values	Mean	SD	CV%	y=	r	Sy.x
%NEUT	36 h	72 h	40 to 77	55.0	0.9	1.6	1.02x - 0.6	0.997	1.6
%LYMPH	36 h	72 h	16 to 44	31.3	0.9	2.9	1.00x + 0.8	0.997	1.7
%MONO	72 h	72 h	4 to 9	7.2	0.5	6.9	0.85x - 0.3	0.943	0.8
%EOS	8 h	72 h	1 to 7	3.4	0.3	8.8	0.87x + 0.2	0.979	0.4
%BASO	72 h	56 h	0 to 1	0.5	0.1	20.0	0.67x + 0.0	0.772	0.2
%LUC	72 h	72 h	1 to 4	2.5	0.4	16.0	0.92x + 0.6	0.994	0.7

RETIC Method Data

The sample stability, expected ranges, and performance characteristics for the RETIC method are listed in the following Table.

	Sample Stability		Expected	Imprecision			Correlation Data			Observed	Analytical Range	
	Room Temp	Refrigerated	Values	Mean	SD	CV%	y=	r	Sy.x	Carryover	Range	Deviation
%RETIC	**24h**	**72 h**	**0.8 to 2.1**	**1.2**	**0.16**	**13.3**	**0.82x + 0.2**	**0.925**	**0.4**	★	**0.2 to 24.9**	**2.6**
#RETIC (10^6/L)	★	★	**40 to 79**	**57.8**	**7.7**	**13.3**	**0.79x + 7.8**	**0.903**	**13.6**	★	★	★
CHr (pg)	**24 h**	**72 h**	**24 to 36**	**28.9**	**0.2**	**0.7**	**0.96x + 4.2**	**0.940**	**1.7**	★	★	★
RTC RBC Count	★	★	★	★	★	★	★	★	★	**1.0%**	★	★

★ not available or not applicable for this parameter

ADVIA Autoslide® Slide Maker Stainer

OVERVIEW **2**

LOADING REAGENTS **11**

LOADING SLIDE RACKS **12**

LOADING SLIDES **12**

EMPTYING THE STAIN WASTE CONTAINER **13**

RUNNING THE DAILY STARTUP MANUALLY **13**

ORDERING A SLIDE MANUALLY **14**

STAINING MANUALLY SMEARED SLIDES **14**

RESETTING THE AUTOSLIDE MODULE **14**

STOPPING THE AUTOSLIDE MODULE (FAST STOP) **15**

RUNNING THE DAILY SHUTDOWN MANUALLY **15**

DISCONNECTING AN AUTOSLIDE 90° CONFIGURATION **15**

AUTOSLIDE METHODS **20**

- MAY-GRÜNWALD GIEMSA METHOD 20
- MODIFIED WRIGHT METHOD 25
- WRIGHT GIEMSA METHOD 31

PERIODIC MAINTENANCE **36**

- REMOVING GLASS PARTICLE WASTE 36
- CLEANING THE STAIN OVERFLOW TRAY 38
- PERFORMING WEEKLY SHUTDOWN AND STARTUP 39
- CLEANING THE STAINER WELLS AND PLATE 39
- CLEANING THE FAN FILTER 42
- REPLACING THE SMEARING TAPE AND CLEANING THE SMEARING WEDGE 43
- REPLACING THE PRINTER RIBBON 44
- REPLACING THE AUTOSLIDE FUSES 46

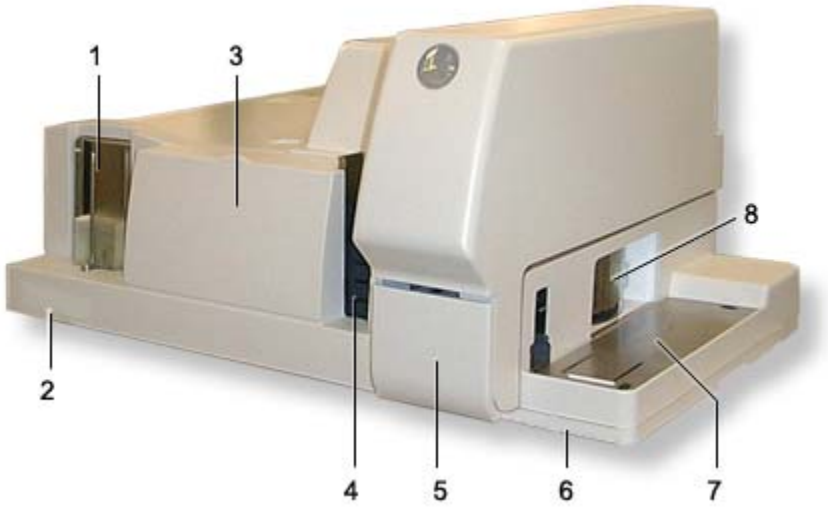
ERROR MESSAGES AND SUGGESTED ACTIONS **47**

AUTOSLIDE SPECIFICATIONS **53**

Overview

The optional ADVIA® Autoslide Slide Maker Stainer is connected to the ADVIA 2120/2120i Hematology System and controlled by the ADVIA 2120/2120i system software. It can automatically prepare and stain a high-quality blood smear on a microscope slide for white blood cell (WBC) differential analysis and microscope examination. The system makes and stains slides based upon criteria that you can customize in the system software. You can also choose to have slide making occur on all slides or no slides and you have the option for slides to be prepared but not stained.

IMPORTANT
The system produces slides for samples aspirated in the autosampler mode *only*.



1 Slide dispenser

2 Broken slide tray

3 Front access door

4 Rack loader

5 Manual/STAT inlet door

6 Stain overflow collection tray

7 Rack collection area

8 Stainer access door

Slide dispenser



WARNING

Do not try to empty the slide dispenser! Finger injuries may occur if slides are removed from the slide-dispenser assembly. Avoid any unnecessary contact with the slide-dispenser mechanical device. The slide-dispenser cover cannot be removed without using a tool. Do not disable the sensors.

Broken slide tray




WARNING **BIOHAZARD**

All sharp objects, such as broken slides, should be considered biohazardous and disposed of in an appropriate container. To avoid personal injury, handle broken slides with care. Wear personal protective equipment. Use universal caution. For complete biohazard statement, refer to section on *Autoslide Safety Information and Warnings*.

Front access door




WARNING **BIOHAZARD**

To avoid operator injury, the access doors on ADVIA Autoslide Slide Maker Stainer are equipped with sensors that stop Autoslide operation when opened.

Wear personal protective equipment. Use universal caution. For complete biohazard statement, refer to section on *Autoslide Safety Information and Warnings*.

When the front access door is opened during Autoslide operation, the slide maker portion of the system stops; slide transfer and staining continue to operate.

Stain overflow collection tray



WARNING

Staining reagents contain methanol that is flammable and toxic. For complete methanol safety statement, refer to section on *Autoslide Safety Information and Warnings*.

To avoid personal injury and damage to the instrument, you must check the reagent overflow tray periodically to verify that there are no leaks of the reagents.

If liquid is present, switch the instrument off, discard the liquid into waste container using appropriate safety precautions, and call your local technical service provider or distributor.

Do *not* replace hoses. Contact your local technical service provider or distributor for this procedure.

Stainer access door

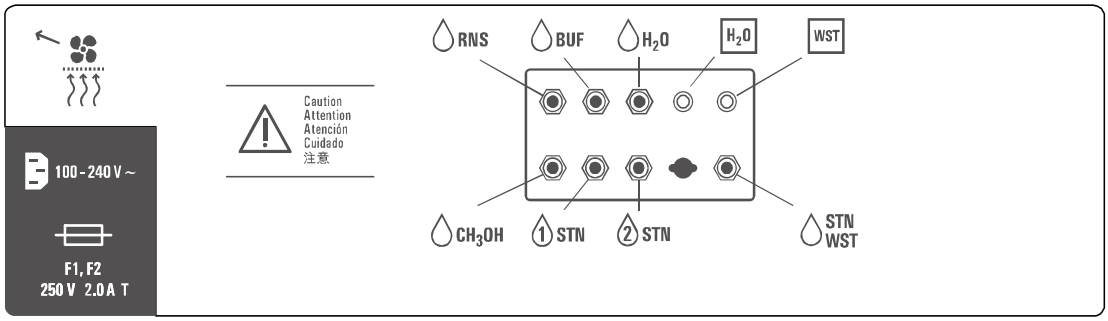
WARNING **BIOHAZARD**

To avoid operator injury, the access doors on ADVIA Autoslide Slide Maker Stainer are equipped with sensors that stop Autoslide operation when opened.

Wear personal protective equipment. Use universal caution. For complete biohazard statement, refer to section on Autoslide Safety Information and Warnings.

When the stainer access door is opened during Autoslide operation, all Autoslide actions stop.

Autoslide Rear Panel



Key:

RNS	BUF	H_2O	H_2O	WST
Rinse	**Buffer**	**Water**	**Water Sensor**	**Stain Waste Sensor**
CH_3OH	1 STN	2 STN		STN WST
Methanol	**Stain 1**	**Stain 2**		**Stain Waste**

Fan

CAUTION

Do not obstruct fan

Main power switch and power supply connection



CAUTION

The power switch and input voltage supply connection should always be accessible. When positioning the system for operational use, leave the required amount of space for easy accessibility to these items.

Installation, connection, and disconnection of the ADVIA Autoslide Slide Maker Stainer must be performed by authorized personnel only.

For the main supply, grounding is required. Check that earth wall-plug is correctly connected to the laboratory grounding system. If there is no such system, a ground stake should be used.

Use only main supply cable delivered with the instrument or cable with same characteristics:

- Europ cord type: HO5VV-F
- USA cord type: SVT,AWG 18-3

Main supply voltage fluctuations not to exceed ± 10% of the nominal voltage.

Fluidic and sensor connections



BIOHAZARD

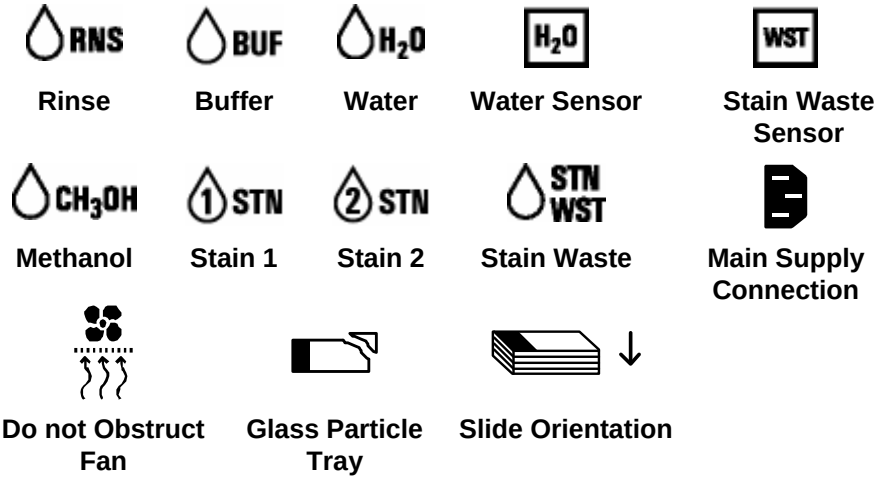
Wear personal protective equipment. Use universal caution. For complete biohazard statement, refer to section on *Autoslide Safety Information and Warnings*.



METHANOL SAFETY

For complete methanol safety statement, refer to section on *Autoslide Safety Information and Warnings*.

ADVIA Autoslide Slide Maker Stainer-specific symbols:



Autoslide Safety Information and Warnings

IMPORTANT
Installation, connection, and disconnection of the ADVIA Autoslide Slide Maker Stainer must be performed by authorized personnel only.

Before moving the instrument, contact your local service provider or distributor for necessary information.

Use the lifting handles delivered with the instrument to lift or move the instrument.

Before shipping the instrument, whatever the destination, an external decontamination must be carried out.

Perform a general cleaning of the instrument before transporting, disposing of, or temporarily removing it from use.

The Autoslide must be stored and shipped at a temperature of between -20° C and +50° C.

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.



ELECTRICAL WARNING

To avoid exposure to shock hazards or damage to the instrument while performing a procedure, power off the analyzer before proceeding.

The following parts must not be handled or checked by the user:

- Electrical power supply
- Electronic circuit boards

Operator injury may occur from an electric shock. Electronic components can shock and injure the user. Do not temper with the instrument and do not remove any components covers, doors, panels, etc.) unless otherwise instructed within this document.



WARNING

Do not disable sensors. Doing so may result in operator injuries. Do not open the Autoslide doors or covers during instrument operation. This causes the instrument to stop operation and cancel any running slides.



WARNING

Do *not* disable sensors. Doing so may result in operator injuries. Do *not* open the Autoslide doors or covers during instrument operation. This causes the instrument to stop operation and cancel any running slides.



METHANOL SAFETY

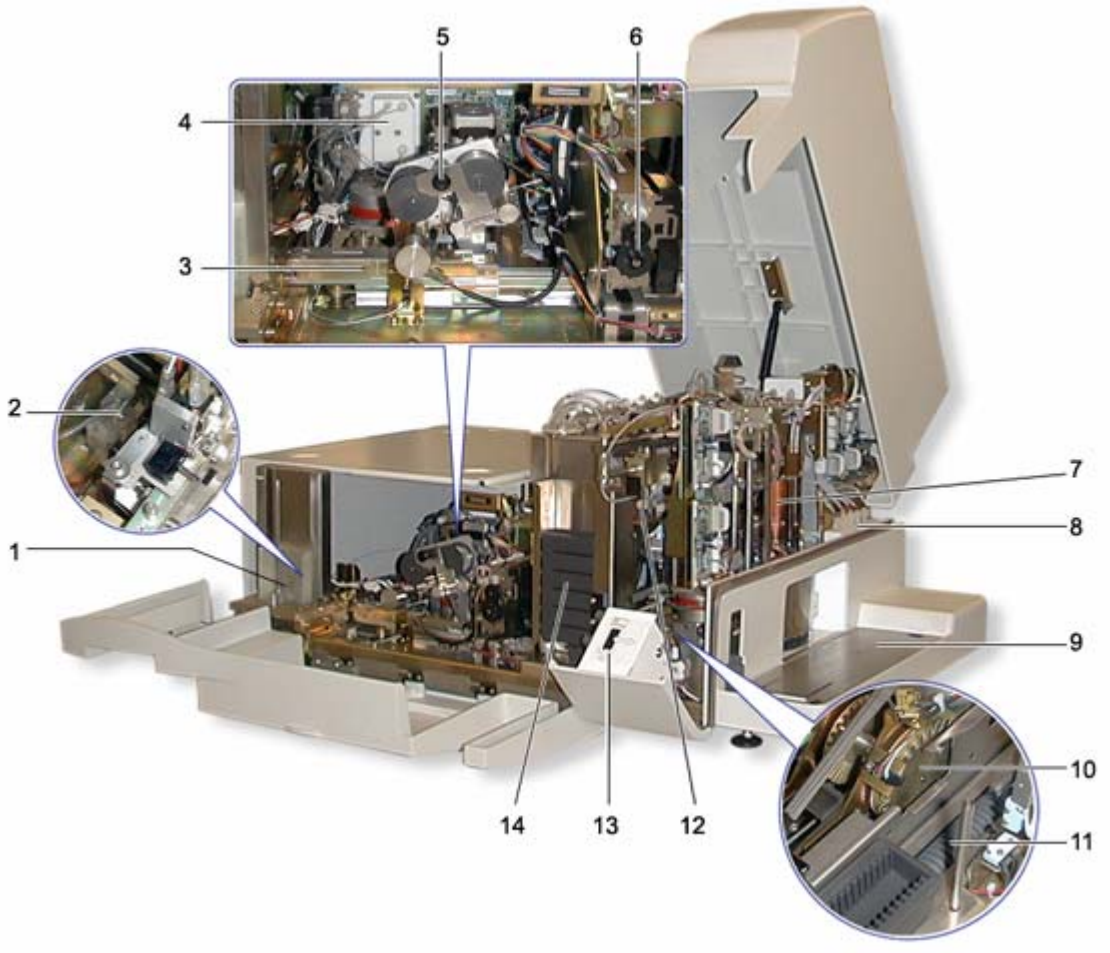


Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

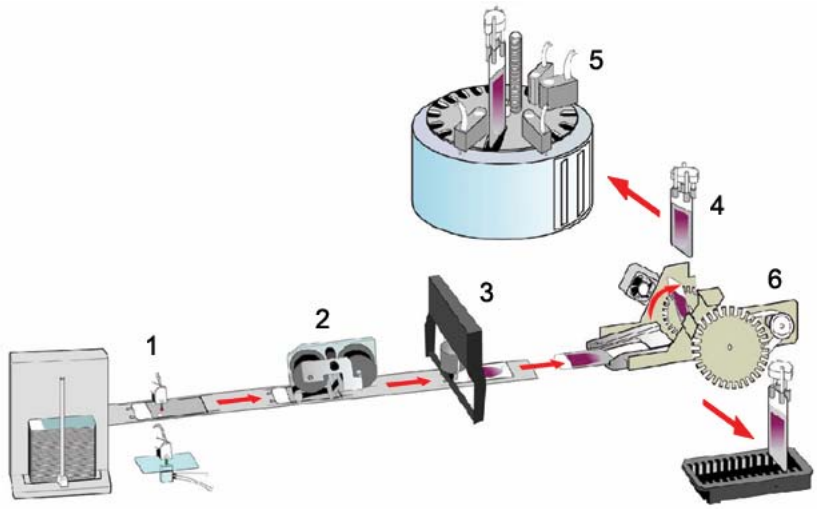


Highly Flammable! Highly flammable. Keep away from sources of ignition. No smoking.

Theory of Operation



1 Slide dispenser	**6 Printer**	**11 Rack transfer**
2 Drop needle	**7 Stainer assembly**	**12 Slide transfer / grabber**
3 Slide carrier	**8 Reagent syringes**	**13 Manual inlet**
4 Sampling syringes	**9 Rack out queue**	**14 Rack loader**
5 Smearer	**10 Verticalizer**	



1. The drop needle dispenses a drop of the sample on a slide. It dispenses the rest of the sample into the drop needle rinse bath and then is rinsed with rinse.
2. The smearing assembly wedge and smearing ribbon create the smear using the surface tension of the blood. The wedge is positioned on the slide before being brought into contact with the blood, waiting for the blood to migrate along the wedge. The waiting time, drop size, smearing speed, and angle of the wedge are all user-adjustable.

 The system then pulls the slide back, producing the smear.

 After smearing, the system raises the smearing head and the smearing tape moves to ready a clean section for the next slide.
3. The slide enters the printer, which can print patient demographics or other information directly on the slide.
4. After printing, the slide moves into the verticalizer, which transfers it to a staining well or directly to a rack as required.
5. If staining is required, the slide moves into the stainer, a rotating tray containing 32 staining wells. A needle plate supports needles at adjustable locations to dispense liquids into the wells or to aspirate liquid from the wells. The slide is stained according to the staining method in use.
6. Once staining is complete, the slide is transferred to a rack and processing is complete.

Autoslide Daily Routine

1. Check the level of the stain waste container. Empty the container if necessary.
2. Check the levels and expiration dates of the autoslide reagents. Load reagents if necessary. Remember to prime the lines for any new reagent. Check the water level if your system uses it.
3. Load slides and racks.
4. Check smearing tape status and replace if necessary.
5. If the system is not set to perform the daily startup cycle automatically, perform the daily startup procedure manually.
6. Run samples. The system will automatically prepare slides according to the software settings. You can also request a slide for a sample regardless of the results, or use the Autoslide module to stain manually smeared slides.
7. If the system is not set to perform the daily shutdown cycle automatically, perform the daily shutdown procedure manually.

Autoslide Operation

Loading Reagents

If reagent levels are low or the expiration date of a reagent has passed, load additional reagents using the following procedure

1. Detach the appropriate reagent container and replace it with a new one.
2. At the Logs menu, select **Reagent Log** and then select **Autoslide Reagent Log**.

 The software opens to the Reagent Inventory window.
3. Select **Reagent Installation**.
4. For each new reagent, enter the **Reagent Volume**, **Lot #**, and **Expiration Date**.

 IMPORTANT
 Both the Modified Wright and the Wright Giemsa Methods use the same reagent bottle for Stain 1 and Stain 2. In order for the reagent alarms to work properly, you must determine the volumes to enter using the following calculations.

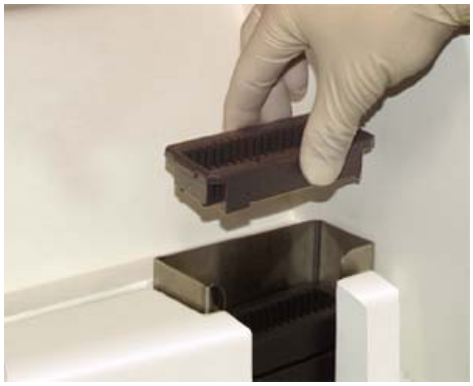
Stain 1	Bottle Volume – Stain 2 Volume
Stain 2	Bottle Volume x Dilution Ratio

NOTE: The Dilution Ratio is defined in the staining profile.

5. Select **OK**.
6. When prompted to prime lines, select **Yes**. The system allows only one prime cycles; select **OK**.
7. If bubbles remain in the reagent lines, prime the lines again using the Reagent Inventory window.

Loading Slide Racks

- Load at least two racks into the rack loader. The rack loader can hold up to 9 racks at a time.
- Load the racks as shown below, with the slide grooves facing upwards.
- You can load racks at any time.



Loading Slides

When the autoslide startup cycle runs, the slide dispenser must contain slides and there must be racks in the rack loader.

WARNING

Do not try to empty the slide dispenser. Finger injuries and sensor damage can occur if you attempt to remove slides from the slide dispenser.

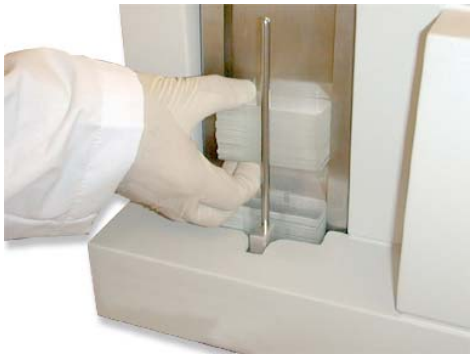
Microscope slides - storage and handling

When storing and handling microscope slides, follow these precautions:

- Microscope slides and cover glasses should be rotated when stored.
- To prevent moisture contamination, store the slides off the floor.
- To minimize temperature and humidity changes, keep slides as far away as possible from doors and heating or air conditioning ducts.
- Remember, slides do not have to be old to be affected by moisture.

Slides should be allowed to come to Lab temperature, before they are opened.

- Use slides provided by Siemens approved vendors *only*.
 Size: 76 x 26 x 1mm
 Description: ground edges, rounded corners, super frost
- Avoid touching slide surfaces with your fingers.
- Control-painted areas of the slides are all facing up.



- Make sure slides are not stuck together before loading.
- Make sure to load the slides in the correct orientation. The painted area must be on the top of the slides and on the left-hand side of the stack.
- Insert a stack of slides as shown above. The stack of slides must reach the stack level detectors. The slide dispenser can hold up to 160 slides.

Emptying the Stain Waste Container

The stain waste is collected in a container located behind the system. Empty the container periodically or whenever the system indicates that the container is full.

Stain waste must be collected using the tube and container specified by local regulation. Stain waste contains methanol. Methanol is a solvent that may destroy an inappropriate connection and cause leaks that are dangerous for the user and damaging to the instrument.

Dispose of waste according to local regulatory requirements.

WARNING

Make sure that the Autoslide module is *not* processing slides while you disconnect the stain waste container

IMPORTANT
Local laws and regulations protect the environment and encourage resource conservation by regulating the disposal of hazardous wastes. Because some of the wastes generated by the analyzer may be classified as hazardous waste, you must be familiar with the applicable hazardous waste handling and disposal laws and regulations in your area.

Running the Daily Startup Manually

Your system can be set to run the startup procedure at a preset time. However, if the system is not set to do so, or if you are starting it at a different time, perform the following steps.

1. At the Operations menu, select **Autoslide Control**.
2. In the Autoslide Control tab, select **Startup** and then select **Start**.

Ordering a Slide Manually

You can order a slide for a blood sample that does meet the slide-making criteria set in the software. To manually trigger slide production for a sample, use the Order Entry tab on the Data Manager menu to add the SLIDE "test" to the workorder. You can also create a workorder for a sample that contains no tests other than SLIDE.

1. At the Data Manager menu, select **Order Entry**.
2. In the Order Entry tab, open the existing workorder for the sample or create a new one.
3. Add **SLIDE** to the tests requested in the workorder and then select **OK**.
4. Run the sample using the autosampler. The system will make the slide as ordered.

Staining manually smeared slides

You can use the Autoslide module to stain slides that have been manually smeared away from the system.

1. Make sure the ADVIA 2120/2120i system is not processing samples and is idle.
2. At the Operations menu, select **Autoslide Control**.
3. In the **Autoslide Control** tab, select the **Manual/STAT Door** option and then select **Start**.
4. When the door opens, insert the slide into the holder door with blood smear on the right with the frosted end up. Make sure the slide is fully seated in the holder; if the slide does not rest on the bottom peg, it may break.
5. Close the manual/STAT inlet door.
 When the system is ready to process the slide, the manual cycle starts; this may take up to 30 seconds. The slide is transferred to the staining assembly and the staining operation begins. At the end of the cycle, the slide is loaded into a rack and the manual inlet door opens.
6. Insert the next manually smeared slide. If you have no more slides to stain, close the manual/STAT inlet door.
7. Return to normal analyzer and autoslide operation.

Resetting the Autoslide Module

The Reset Autoslide button displays on some autoslide-related software tabs and windows, most notably the Autoslide Control tab at the Operations menu.

Click this button to reset the Autoslide module. This function is intelligent and will reset only those autoslide mechanisms that require resetting. This may be necessary when troubleshooting Autoslide module errors.

Depending on the state of the system, this may take up to 16 minutes.

Stopping the Autoslide Module (Fast Stop)

The **Fast Stop** button displays on some autoslide-related software tabs and windows, most notably the Autoslide Control tab on the Operations menu.

Click this button to immediately stop the Autoslide module.

Any slides that are in the stainer will be lost when a Fast Stop occurs.

When a Fast Stop occurs, you must perform a Stainer Evacuation before returning to normal system operation.

Running the Daily Shutdown Manually

Your system can be set to run the shutdown procedure at a preset time. However, if the system is not set to do so, or if you are shutting down at a different time, perform the following steps.

1. At the Operations menu, select **Autoslide Control**.
2. In the Autoslide Control tab, select **Shutdown** and then select **Start**.

 IMPORTANT
 Once the Daily Shutdown has occurred, you must perform a Daily Startup before resuming Autoslide operation.

Disconnecting an Autoslide 90° Configuration

The following procedure explains how disconnect the ADVIA Autoslide system when it is in a 90° configuration for lab automation or a stand alone system.

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

CAUTION

Do not move the support structure that the ADVIA Autoslide resides on more than 0.3 m (1 ft). Make sure that the interface cable and ground strap has enough slack when you move the support structure.

1. Make sure all system activity is complete before you disconnect the 90° configuration.

 NOTE: Make sure that no slides are present in the Autoslide Stainer.

2. Place the ADVIA 2120/2120i system in Standby.

3. Select Off on the control panel to shut off the ADVIA 2120/2120i system.

 This prevents any further system function. The system displays the following message, “communication error with autoslide”. The Autoslide icon remains green.

 NOTE: The Autoslide system can remain on.

4. Unscrew the Austoslide sample blood line (**1**).

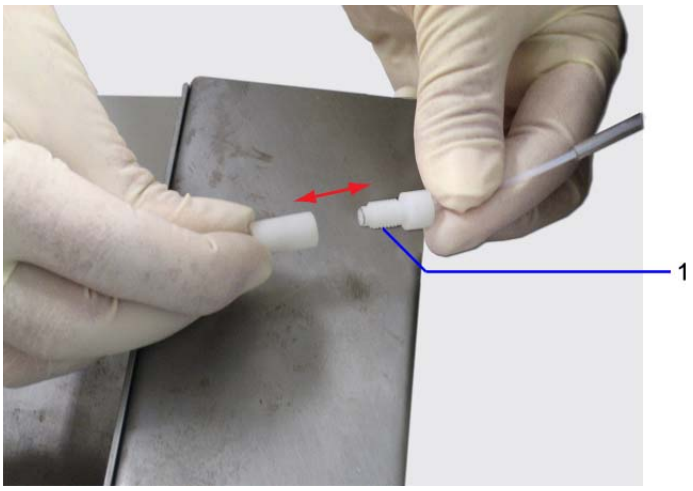


Figure 1. Sample Blood Line

5. Pry open the protective conduit tubing where the vacuum (**1**) and pressure (**2**) lines reside.

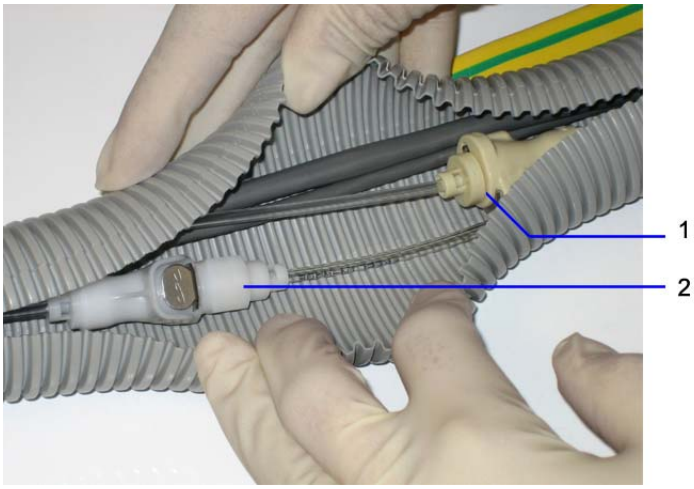


Figure 2. Vacuum and Pressure Lines

6. Push the metal lever and pull the vacuum line (**1**) to disconnect.

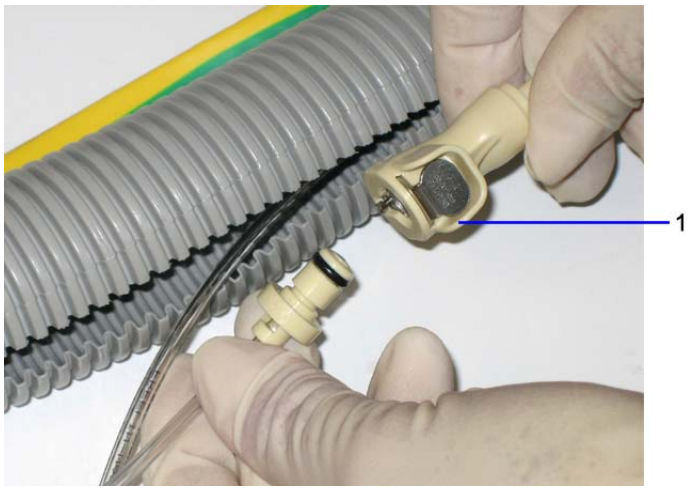


Figure 3. Vacuum Line

7. Push the metal lever and pull the pressure line (**1**) to disconnect.

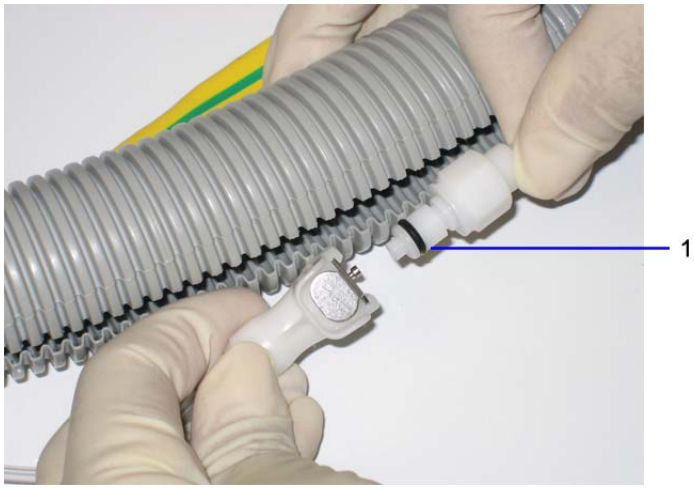


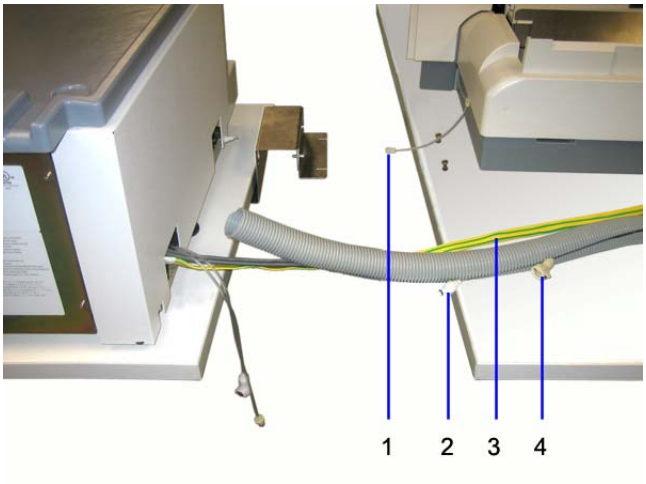
Figure 4. Pressure Line

8. Loosen the 2 screws where the slots are on the Autoslide cart bracket so you can move the support structure.



Figure 5. Autoslide cart bracket with loosened screws

9. Move the support structure forward up to 0.3 m (1 ft), ensuring that the electrical cables are not stretched to far.



1 Blood sample line
2 Pressure line
3 Ground strap
4 Vacuum line

Figure 6. Moved Support Structure

NOTE: The ground strap and interface cable remain connected to the Autoslide. Disconnecting the sample blood line, pressure line, and vacuum lines allows you to move the Autoslide approximately 0.3 m (1 ft).

10. To reconnect the Autoslide, move the Autoslide module back into position.

11. Tighten the clamp screws.

12. Replace and connect all lines disconnected in steps 4-8.
13. When the reconnection is complete turn the ADVIA 2120/2120i system back on.

 The Autoslide icon turns grey. Wait until the Autoslide established communication with the analyzer. The icon goes from grey to orange, and then to green. Do not initiate any command until communication is established and the icon for the Autoslide is green.

Autoslide Methods

May-Grünwald Giemsa Method

Intended Use

The May-Grünwald Giemsa method is for *in vitro* diagnostic use in the differential staining of blood, bone marrow and body fluid smears on the ADVIA Autoslide Slide Maker Stainer. Stained smears are evaluated to identify and quantify cells in whole blood and other specimens to aid clinicians in the assessment of various clinical conditions.

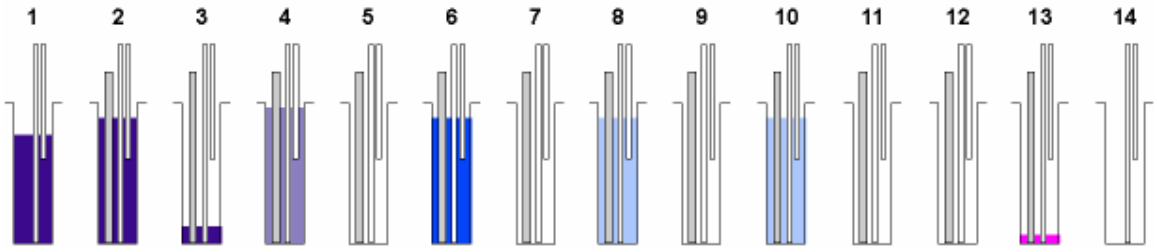
Summary and Explanation

The reagent protocol for the ADVIA Autoslide Slide Maker Stainer consists of a modified methylene blue-eosin stain and is based on the original stain proposed by Pappenheim.

The ADVIA Autoslide Slide Maker Stainer is a smart, fully automated system. It is capable of producing stained smears on all specimens run on the ADVIA 2120/2120i or only on samples with predefined criteria (*i.e.* flags or parameter threshold). The autoslide module also provides a direct access port to the stainer for pre-smeared slides.

Staining Protocol

The following is a brief description of the staining protocol:



1. Dispensing May-Grünwald Stain (Stain 1) (DN1).
2. Slide introduction.

3. Partial draining of May-Grünwald Stain (Stain 1) (AN2).
4. Dispensing Buffer to dilute May-Grünwald Stain (Stain1) (DN3).
5. Draining (AN3).
6. Dispensing diluted Giemsa Stain (Stain 2) (DN3).
7. Draining (AN7).
8. Dispensing rinsing solution (distilled water) (DN7).
9. Draining (AN7).
10. Dispensing rinsing solution (distilled water) (DN7).
11. Draining (AN7).
12. Draining (AN4).
13. Dispensing methanol (DN4).
14. Slide removal

Needle	Position	Action
DN1 (Undil. Stain 1)	32	1
DN2 (Buffer)	8	1
DN3 (Dil. Stain 2)	13	1
DN4 (Methanol)	31	0
DN7 (Rinse)	18	2
AN2	8	1
AN3	13	1
AN4	31	1
AN7	18	3

Methanol Volume (mL)	1.6
Stain Volume (mL)	3.6
Dilution Ratio (%)	5
Duration	Long

Principle of the Procedure

The 2 staining mixtures used by this protocol have very distinct proprieties. The May-Grünwald (STAIN 1) stains acidophilic sites of cells and the neutrophilic granulations of leukocytes, whereas the Giemsa (STAIN 2) stains the cytoplasm of the monocytes and lymphocytes, as well as the nuclear chromatin. The stained smear is examined microscopically and cells are then manually differentiated and quantified.

Cell Type	Cell Component	Color
Neutrophils	Nuclei	Deep purple

Cell Type	Cell Component	Color
	Cytoplasm	Pink
	Granules	Light purple-violet
Lymphocytes	Nuclei	Deep purple
	Cytoplasm	Blue
Monocytes	Nuclei	Light purple
	Cytoplasm	Blue-gray
	Granules	Fine pink to violet
Eosinophils	Nuclei	Pale purplish-blue
	Cytoplasm	Bluish-pink
	Granules	Orange
Basophils	Nuclei	Purplish-blue,
	Cytoplasm	Faint pink
	Granules	Deep purple
Platelets	Cytoplasm	Light blue
	Granules	Blue to violet-blue
Red Blood Cells	Biconcave disks	Pink
Howell-Jolly bodies		Dark purple
Dohle bodies		Blue-gray
Promyelocyte and Auer Rods	Granules	Dark blue to Purplish-red

Causes of RBC Artifacts

- Post-stain rinsing too short
- Reagents expired
- May-Grünwald Stain open for extended period
- Dirty stainer
- Room temperature too high
- Humidity too high
- Slide not dry before examination

Reagents and Supplies

For *in vitro* diagnostic use.

Reagents are ready to use and require no preparation.

REF	Contents	Symbols	Amount
00283949 00327415 (Japan)	May-Grünwald Stain 1	① STN	4 x 2.5 L
00283167 00327733 (Japan)	Giemsa Stain 2	② STN	6 x 0.5 L
00284988	May-Grünwald Giemsa Buffer	BUF	4 x 2.5 L
00286794 00326788 (Japan)	Methanol	CH_3OH	4 x 2.5 L
06837687	ADVIA Autoslide Rinse	RNS	10 L

Stain 1 - May- Grünwald Stain

- Methanol, 99.65 %
- Methylene blue – Eosin, 0.35 %



R39/23/24/25
S7, S24, S36/37, S45

Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **Contains methanol**.



R11
S16

Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. **Contains methanol**.

Stain 2 - Giemsa Stain

- Methanol, 56 %
- Glycerol, 43 %
- Methylene blue – Eosin, 1 %



R39/23/24/25
S7, S24,

Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **Contains methanol**.

S36/37, S45



Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. Contains methanol.

R11
S16

May- Grünwald Buffer

- Phosphate buffer
- Preservative

Methanol

- Methyl Alcohol ≥ 99.8 %



Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **Contains methanol.**

R39/23/24/25
S7, S24,
S36/37, S45



Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. **Contains methanol**.

R11
S16

Reagent Storage and Stability

Store Stains, Buffer, and Methanol tightly closed between 15°C and 25°C.

Cover open reagent bottles with Parafilm or equivalent to avoid excessive evaporation.

When unopened, reagents are stable until the expiration date printed on the product label when stored at room temperature between 15°C and 30°C.

Once opened, reagents are stable for 45 days.

Do not refrigerate.

Refer to the online ADVIA 2120/2120i Operator's Guide for information on specimen collection.

Material required but not provided

Microscope slides (26 x 76 x 1 mm)
Size: 76 x 26 x 1mm
Description: ground edges, rounded corners, super frost

Use slides provided by Siemens approved vendors only.

Limitations

May-Grünwald Giemsa reagents produce high quality stained blood films. However, there may be personal preferences in shades and intensities of staining not satisfied by the system.

Results

When used with the ADVIA Autoslide Slide Maker Stainer, the May-Grünwald Giemsa reagents will produce a consistent stain quality to facilitate accurate and reliable interpretation.

Technical Assistance

For customer support, please contact your local technical support provider or distributor.

Bibliography

1. White WL, Erickson MM, Stevens SC. *Practical Automation for the Clinical Laboratory.* St. Louis, MO, CV Mosby Co., pp 476-487 (1972)
2. Moss ED. Automated Slide Staining in Haematology. *Can. J. Med. Tech.* **30 (5)**: 169 (1968)
3. Langeron M., *Precis de microscopie, Masson*, Paris 6eme ed., pp 566-585 (1942)

Modified Wright Method

Intended Use

The Modified Wright method is for in vitro diagnostic use in the differential staining of blood, bone marrow and body fluid smears on the ADVIA Autoslide Slide Maker Stainer. Stained smears are evaluated to identify and quantify cells in whole blood and other specimens to aid clinicians in the assessment of various clinical conditions.

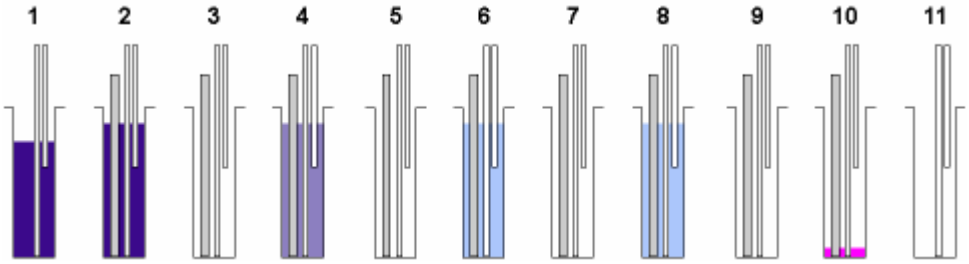
Summary and Explanation

The reagent protocol for the Autoslide Slide Maker Stainer consists of a modified polychrome methylene blue-eosin stain and is based on the original stain proposed by Romanowsky.

The ADVIA Autoslide Slide Maker Stainer is a smart, fully automated system. It is capable of producing stained smears on all specimens run on the ADVIA 2120/2120i or only on samples with predefined criteria (*i.e.* flags or parameter threshold). The Autoslide provides also a direct access port to the stainer for pre-smeared slides.

Staining Protocol

The following is a brief description of the staining protocol:



1. Dispensing Modified Wright or Wright-Giemsa Stain (DN1).
2. Slide introduction.
3. Draining Modified Wright or Wright-Giemsa Stain (AN3).
4. Dispensing diluted Modified Wright or Wright-Giemsa Stain (DN3).
5. Draining (AN7).
6. Dispensing rinsing solution (distilled water) (DN7).
7. Draining (AN7).
8. Dispensing rinsing solution (distilled water) (DN7).
9. Draining (AN4).
10. Dispensing methanol (DN4).
11. Slide removal.

Needle	Position	Action
DN1 (Undil. Stain 1)	32	1
DN2 (Buffer)	22	0
DN3 (Dil. Stain 2)	8	1
DN4 (Methanol)	31	0
DN7 (Rinse)	24	2
AN2	22	0
AN3	8	1
AN4	31	1
AN7	24	2

NOTE: Needles AN2 and DN2 in position 22 are unused in this protocol.

Methanol Volume (mL)	1.6
Stain Volume (mL)	3.6
Dilution Ratio (%)	25

Duration	Long

Principle of the Procedure

The stained smear is examined microscopically; the nucleus and the cytoplasm of neutrophils, lymphocytes, monocytes, eosinophils, and basophils show a characteristic blue or red coloration. Cells are then manually differentiated and quantified.

Cell Type	Cell Component	Color
Neutrophils	Nuclei	Vibrant deep purple
	Cytoplasm	Pink background
	Granules	Light purple-violet
Lymphocytes	Nuclei	Distinct deep purple
	Cytoplasm	Sky blue to deep blue
Monocytes	Nuclei	Light purple with distinct spaces between chromatin strands
	Cytoplasm	Dull blue-gray with lightly stained
	Granules	Fine pink to violet and evenly distributed
Eosinophils	Nuclei	Pale purplish-blue and well defined
	Cytoplasm	Bluish-pink
	Granules	Reddish-orange, large and spherical in shape
Basophils	Nuclei	Purplish-blue, can have reddish tone
	Cytoplasm	Faint pink
	Granules	Distinct deep purplish-blue to purplish-black
Platelets	Cytoplasm	Distinct light blue
	Granules	Small blue to violet-blue, tend to aggregate in center
Red Blood Cells	Biconcave disks	Reddish to reddish-pink in color, intensity of stain is less in central area where cell is thinnest.
Howell-Jolly bodies		Dark purple
Dohle bodies		Pale Blue to pale blue-gray

Promyelocyte	Granules	Dark blue to reddish blue
Auer Rods		Purplish-red

Causes of RBC Artifacts

- Post-stain rinsing too short
- Reagents expired
- Stain open for extended period
- Dirty stainer
- Room temperature too high
- Humidity too high
- Slide not dry before examination

Reagents and Supplies

For *in vitro* diagnostic use.

Reagents are ready to use and require no preparation.

REF	Contents	Symbols	Amount
08100142 0097053 (Japan)	Modified Wright Stain	1 STN	4 x 3.8 L (1 gallon)
08100290	Modified Wright Buffer	BUF	4 x 3.8 L (1 gallon)
08096412 00096669 (Japan)	Methanol	CH_3OH	4 x 3.8 L (1 gallon)
06837687	ADVIA Autoslide Rinse	RNS	10 L

Modified Wright Stain

- Methanol, > 99 %
- Polychrome methylene blue-eosin stain, 0.3 %



Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **Contains methanol**.

R39/23/24/25
S7, S24, S36/37, S45



Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. **Contains methanol.**

R11
S16

Modified Wright Buffer

- Phosphate buffer
- Surfactant

Methanol

- Methyl Alcohol ≥ 99.8 %



Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **Contains methanol.**

R39/23/24/25
S7, S24, S36/37, S45



Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. **Contains methanol**.

R11
S16

Reagent Storage and Stability

Store Stain, Buffer, and Methanol tightly closed between 15°C and 30°C.

Cover open reagent bottles with Parafilm or equivalent to avoid excessive evaporation.

When unopened, reagents are stable until the expiration date printed on the product label when stored at room temperature between 15°C and 30°C.

Once opened, reagents are stable for 45 days.

Do not refrigerate.

Refer to the online ADVIA 2120/2120i Operator's Guide for information on specimen collection.

Material required but not provided

Microscope slides (26 x 76 x 1 mm)
Size: 76 x 26 x 1mm
Description: ground edges, rounded corners, super frost

Use slides provided by Siemens approved vendors only.

Limitations

Modified Wright reagents produce high quality stained blood films. However, there may be personal preferences in shades and intensities of staining not satisfied by the system.

Results

When used with the ADVIA Autoslide Slide Maker Stainer, the Modified Wright reagents will produce a consistent stain quality to facilitate accurate and reliable interpretation.

Technical Assistance

For customer support, please contact your local technical support provider or distributor.

Bibliography

1. Romanowsky DL. On the Question of Parasitology and Therapy of Malaria. *St. Petersburg Medical Weekly* **16**:297-302 (1891)

2. White WL, Erickson MM, Stevens SC. Practical Automation for the Clinical Laboratory. St. Louis, MO, CV Mosby Co., pp 476-487 (1972)

3. Moss ED. Automated Slide Staining in Haematology. *Can. J. Med. Tech.* **30 (5)**: 169 (1968)

Wright Giemsa Method

Intended Use

The Wright Giemsa method is for in vitro diagnostic use in the differential staining of blood, bone marrow and body fluid smears on the ADVIA Autoslide Slide Maker Stainer. Stained smears are evaluated to identify and quantify cells in whole blood and other specimens to aid clinicians in the assessment of various clinical conditions.

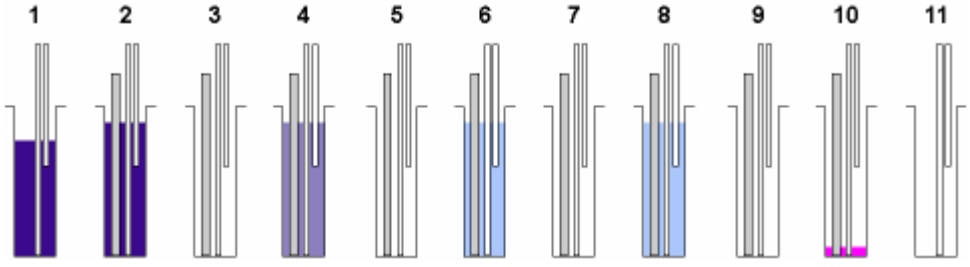
Summary and Explanation

The reagent protocol for the Autoslide Slide Maker Stainer consists of a modified polychrome methylene blue-eosin stain and is based on the original stain proposed by Romanowsky.

The ADVIA Autoslide Slide Maker Stainer is a smart, fully automated system. It is capable of producing stained smears on all specimens run on the ADVIA 2120/2120i or only on samples with predefined criteria (i.e. flags or parameter threshold). The Autoslide also provides a direct access port to the stainer for pre-smeared slides.

Staining Protocol

The following is a brief description of the staining protocol:



1. Dispensing Modified Wright or Wright-Giemsa Stain (DN1).
2. Slide introduction.
3. Draining Modified Wright or Wright-Giemsa Stain (AN3).
4. Dispensing diluted Modified Wright or Wright-Giemsa Stain (DN3).
5. Draining (AN7).
6. Dispensing rinsing solution (distilled water) (DN7).

7. Draining (AN7).
8. Dispensing rinsing solution (distilled water) (DN7).
9. Draining (AN4).
10. Dispensing methanol (DN4).
11. Slide removal.

Needle	Position	Action
DN1 (Undil. Stain 1)	32	1
DN2 (Buffer)	22	0
DN3 (Dil. Stain 2)	8	1
DN4 (Methanol)	31	0
DN7 (Rinse)	24	2
AN2	22	0
AN3	8	1
AN4	31	1
AN7	24	2

NOTE: Needles AN2 and DN2 in position 22 are unused in this protocol.

Methanol Volume (mL)	4
Stain Volume (mL)	3.6
Dilution Ratio (%)	25
Duration	Long

Principle of the Procedure

The stained smear is examined microscopically; the nucleus and the cytoplasm of neutrophils, lymphocytes, monocytes, eosinophils, and basophils show a characteristic blue or red coloration. Cells are then manually differentiated and quantified.

Cell Type	Cell Component	Color
Neutrophils	Nuclei	Vibrant deep purple
	Cytoplasm	Pink background
	Granules	Light purple-violet
Lymphocytes	Nuclei	Distinct deep purple
	Cytoplasm	Sky blue to deep blue
Monocytes	Nuclei	Light purple with distinct spaces between chromatin strands
	Cytoplasm	Dull blue-gray with lightly stained
	Granules	Fine pink to violet and evenly distributed
Eosinophils	Nuclei	Pale purplish-blue and well defined

Cell Type	Cell Component	Color
	Cytoplasm	Bluish-pink
	Granules	Reddish-orange, large and spherical in shape
Basophils	Nuclei	Purplish-blue, can have reddish tone
	Cytoplasm	Faint pink
	Granules	Distinct deep purplish-blue to purplish-black
Platelets	Cytoplasm	Distinct light blue
	Granules	Small blue to violet-blue, tend to aggregate in center
Red Blood Cells	Biconcave disks	Reddish to reddish-pink in color, intensity of stain is less in central area where cell is thinnest.
Howell-Jolly bodies		Dark purple
Dohle bodies	Cytoplasm	Pale Blue to pale blue-gray
Promyelocyte	Granules	Dark blue to reddish blue
Auer Rods	Cytoplasm	Purplish-red

Causes of RBC Artifacts

- Post-stain rinsing too short
- Reagents expired
- Stain open for extended period
- Dirty stainer
- Room temperature too high
- Humidity too high
- Slide not dry before examination

Reagents and Supplies

For *in vitro* diagnostic use.

Reagents are ready to use and require no preparation.

REF	Contents	Symbols	Amount
08096536 00097185 (Japan)	Wright Giemsa Stain	① STN	4 x 3.8 L (1 gallon)

08097532	Wright Giemsa Buffer	BUF	4 x 3.8 L (1 gallon)
08096412 00096669 (Japan)	Methanol	CH_3OH	4 x 3.8 L (1 gallon)
06837687	ADVIA Autoslide Rinse	RNS	10 L

Wright Giemsa Stain

- Methanol, > 99 %
- Polychrome methylene blue-eosin stain



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R39/23/24/25
S7, S24, S36/37, S45



Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. **Contains methanol**.

R11
S16

Wright Giemsa Buffer

- Phosphate buffer
- Surfactant
- Preservative

Methanol

- Methyl Alcohol = 99.8 %



Toxic! Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed. Keep container tightly closed. Avoid contact with skin. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). **Contains methanol.**

R39/23/24/25
S7, S24, S36/37, S45



Highly Flammable! Highly flammable. Keep away from sources of ignition – No smoking. **Contains methanol**.

R11
S16

Reagent Storage and Stability

Store Stain, Buffer, and Methanol tightly closed between 15°C and 30°C.

During the system run, cover each reagent with Parafilm or equivalent to avoid excessive evaporation.

When unopened, reagents are stable until the expiration date printed on the product label when stored at room temperature between 15°C and 30°C.

Once opened, reagents are stable for 45 days.

Do not refrigerate.

Refer to the online ADVIA 2120/2120i Operator's Guide for information on specimen collection.

Material required but not provided

Microscope slides (26 x 76 x 1 mm)
Size: 76 x 26 x 1mm
Description: ground edges, rounded corners, super frost

Use slides provided by Siemens approved vendors only.

Limitations

Wright Giemsa reagents produce high quality stained blood films. However, there may be personal preferences in shades and intensities of staining not satisfied by the system.

Results

When used with the ADVIA Autoslide Slide Maker Stainer, the Wright Giemsa reagents will produce a consistent stain quality to facilitate accurate and reliable interpretation.

Technical Assistance

For customer support, please contact your local technical support provider or distributor.

Bibliography

1. Romanowsky DL. On the Question of Parasitology and Therapy of Malaria. *St. Petersburg Medical Weekly* **16**:297-302 (1891)
2. White WL, Erickson MM, Stevens SC. Practical Automation for the Clinical Laboratory. St. Louis, MO, CV Mosby Co., pp 476-487 (1972)
3. Moss ED. Automated Slide Staining in Haematology. *Can. J. Med. Tech.* **30 (5)**: 169 (1968)

Periodic Maintenance

To ensure the operating efficiency of your Autoslide, be sure to follow the simple maintenance procedures scheduled below:

Weekly

- Clean glass particle waste
- Clean the stain overflow tray
- Perform Weekly shutdown and startup

After processing 3000 Slides

- Clean the stainer wells and plate
- Clean the power supply fan filter

As Needed

- Replace the smearing tape and cleaning the smearing wedge
- Replace the printer ribbon

Removing glass particle waste

Small particles of glass may be chipped off the slides during transfer from the slide dispenser to the slide carrier. These particles are collected in a tray beneath the slide dispenser.

To remove glass particle waste



WARNING

Use caution when handling or troubleshooting objects with sharp edges. The edges may cut and cause injury.

1. Using both hands, carefully pull the tray beneath the slide dispenser toward you and remove it.



2. Discard the glass particles according to your standard laboratory procedures.
3. Replace the tray securely under the slide dispenser.

Cleaning the Stain Overflow Tray

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

Small amounts of stain may overflow from the stainer wells. This overflow is collected in a tray located on the side of the Autoslide beneath the stainer module.

To clean the stain overflow tray

1. Using both hands, carefully pull out the tray, located under the stainer module, and remove it.



2. Using a cloth or paper towels, dampen with a 10% solution of bleach and wipe the tray clean.
3. Let the tray air dry, then replace it securely under the stainer module.

Performing Weekly Shutdown and Startup

The weekly shutdown provides a thorough cleaning of the fluidics circuit and must be performed once a week. Failure to perform the shutdown procedure regularly can result in line clogs.



TOXIC

Methanol is toxic. To avoid serious irreversible effects do not inhale, do not contact with skin and do not swallow. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately.



FLAMMABLE

Methanol is flammable. Keep away from sources of ignition - no smoking.

To perform a weekly shutdown

1. On the ADVIA 2120/2120i software menu, select **Procedures**, then select **Clean Autoslide**.

 The Clean Autoslide window opens.

2. Select **Weekly Shutdown** and follow the instructions displayed on the window to perform a weekly shutdown.

3. When the weekly shutdown completes, you must perform a weekly startup before slide production can resume. If you want turn the system off after the Weekly Shut Down, wait until you are ready to run more samples before performing the Weekly Startup.
4. At the Clean Autoslide window, select **Weekly Startup**.

5. Follow the instructions displayed on the window to perform a weekly startup.

Cleaning the Stainer Wells and Plate



BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

Materials required:

- Methanol
- Laboratory tray
- Paper towels

Time: 15 minutes

Analyzer mode: Standby

NOTE

It is recommended that the stainer wells be replaced once a year. Check the Replaceable Parts section of the Operator's Guide for ordering information.

 **TOXIC**

Methanol is toxic. To avoid serious irreversible effects do not inhale, do not contact with skin and do not swallow. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately.

 **FLAMMABLE**

Methanol is flammable. Keep away from sources of ignition - no smoking.

 **CAUTION**

Make sure *all* slides are processed and transferred to the output queue, *before* turning off the Autoslide. Turning off the autoslide while slides are processing can cause unreliable results and possibly damage Autoslide components.

1. Put the analyzer in Standby mode and turn off the Autoslide.
2. Slide open the stainer tray door.



3. While manually rotating the stainer plate, remove the stainer wells by gently sliding each out of the stainer.



CAUTION

Do not put too much force on the staining wells, when removing them. Pulling up or out too hard may damage the wells. They should be clipped gently into and out of place on the stainer plate.

Place the stainer wells in a tray with enough methanol to completely cover them. Agitate the tray to remove any air bubbles.

4. While the wells are soaking, use a soft cloth or paper towel to clean the stainer plate. Rotate the plate manually to clean the entire surface.



5. After the wells have soaked in the methanol for ten minutes, remove them from the tray and dry them with paper towels.
6. While manually rotating the stainer plate, replace each stainer well with the notch on the bottom closest to the edge of the plate.

 Make sure that the wells are seated properly, all at the same level, in the stainer tray.
7. Slide the stainer tray door closed.
8. Put the analyzer in Ready mode and turn off the Autoslide.

Cleaning the Fan Filter

1. At the back of the Autoslide, turn off the power.
2. Remove the fan cover and separate the filter.



3. Using a vacuum or air canister, clean all dust and dirt from the filter.
4. Assemble the clean filter with the cover and replace it on the rear of the unit.

Replacing the Smearing Tape and Cleaning the Smearing Wedge

BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended for potentially infectious specimens in *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, 2d edition; Approved Guideline (1997) Document M29-A, National Committee for Clinical Laboratory Standards (NCCLS). This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.

Materials required:

- New smearing tape
- Paper towels

Time: 2 minutes

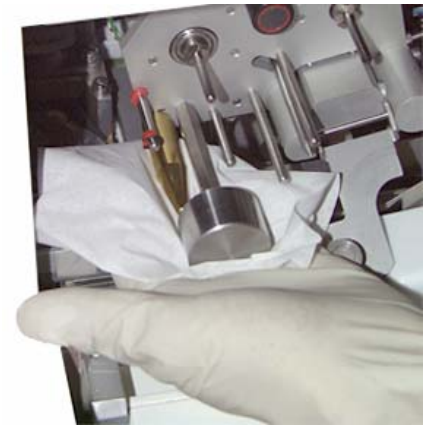
Analyzer mode: Standby

To replace the smearing tape

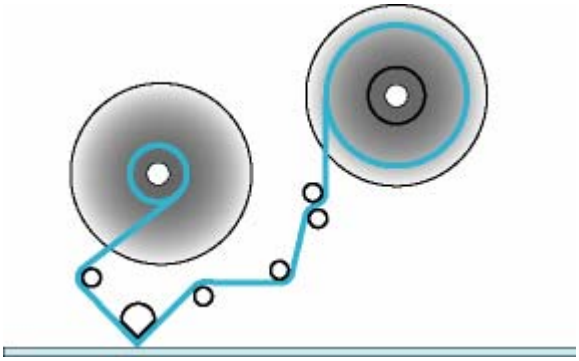
1. At the Operations menu select **Autoslide Control**.
 The Autoslide Control window opens.
2. Under the Special Functions section, select **Smearing Tape**.
3. Under Smearing Tape Options, select **Replace Tape**.
4. Open the Autoslide lower front cover.
5. Using the black magnetic knob, open the tape holder plate.



6. Remove the upper and lower bobbins from their holders.
7. Each time the smearing tape is replaced, wipe the wedge using a soft cloth to remove any dust.



8. Place the new smearing tape bobbin on the upper holder and the take up bobbin on the lower holder. Be careful not to twist or crimp the tape. Thread it through the spindles as shown in the diagram on the inside of the front cover.



9. Close the tape holder plate.
10. At the Autoslide Control window, select **Start** to tighten the tape.

Replacing the Printer Ribbon

Materials required: New print cartridge

Time: 2 minutes

Analyzer mode: Standby

To replace the print ribbon

CAUTION

Make sure *all* slides are processed and transferred to the output queue, *before* turning off the Autoslide. Turning off the autoslide while slides are processing can cause unreliable results and possibly damage Autoslide components.

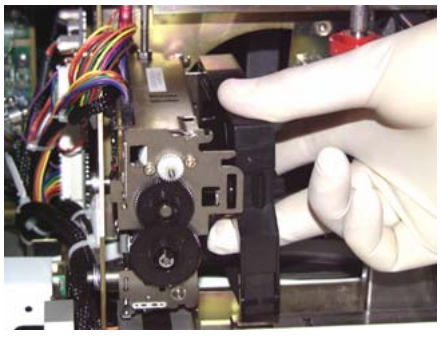
1. Turn off the Autoslide.
2. Open the lower front cover and remove the slide rack loader to gain easy access to the printer ribbon.



NOTE

Removing the slide rack loader will cause an **ASL Stop** condition. This message will clear when you perform an Autoslide Mechanical Initialization at the end of this procedure.

3. Holding both sides of the printer cartridge, press toward the inside of the Autoslide and pull the cartridge out of its holder. Be careful not to tangle the ribbon when removing it.



4. Install the new printer cartridge securely in its holder. Make sure the notches on the cartridge are positioned correctly in the holder.
5. Replace the slide rack loader, close the lower front cover.

6. Place the analyzer in Ready mode, then turn the Autoslide on. Wait a few seconds. The Autoslide will perform a Mechanical Initialization. You *must* wait for the initialization to execute automatically.

Replacing the Autoslide Fuses

IMPORTANT
Do not attempt to replace the Autoslide fuses.

For replacement of all Autoslide fuses, call your Siemens technical support provider or distributor.

Error Messages and Suggested Actions

The list below contains explanations and actions for the Autoslide errors which may occur. In some cases, the suggested action will refer you to the troubleshooting tip(s) below to help you resolve the problem and restore your system to normal operating status.

A **Failure** status indicates that intervention is required to continue using the Autoslide. The **Warning** status indicates intervention is required to prevent an eventual failure

If the suggested actions described below do not resolve the problem, call your technical support provider or distributor.

TIP # 1

The Autoslide may not respond immediately to a command, under certain circumstances, it may take up to 30 seconds for a response from the system. This is due to communication restraints between the ADVIA 2120/2120i system and the Autoslide. It is important to allow time for the system to respond - DO NOT keep clicking the mouse.

TIP # 2

In addition to clearing the source of the problem (such as removing a jammed rack etc.), check the Autoslide Status Screen when an error occurs. If both the stainer and smearer are RED, and there are no slides in the stainer, a **MECHANICAL INITIALIZATION** (homes both smearer and stainer) must be performed. If only the smearer is RED, a **RESET SMEARER** restores the system to "Ready" (GREEN) and allow any slides currently being stained to continue processing.

TIP # 3

If the Autoslide status screen shows RED for the stainer, and slides were being processed, a **RESET AUTOSLIDE** performs a mechanical initialization then drains and removes the slides.

TIP # 4

Autoslide Error Messages are logged to the message log in the order they occur. If a critical error is displayed, go to the postings just before the critical error and click on Details for additional information about the problem.

TIP # 5

If, for any reason, the power needs to be cycled to the Autoslide, allow the instrument reconnect the communication link with the ADVIA 2120/2120i system, do not interrupt.

IMPORTANT: The table below Event/cause/suggested actions supercedes the table currently displayed in the Operator's Guide.

Event Text	Severity	Probable Cause	Suggested Action
ASL - Aspiration needle retract timeout	Failure	Aspiration needle failed to retract in time.	Perform Mechanical Initialization to reset autoslide, check autosampler - if necessary, perform an autosampler reset or power the ADVIA 2120/2120i system off/on.
ASL - Command Timeout - Stop	Failure	Command timeout on autoslide. Run stopped if Alarm/Stop criteria set for critical error.	Perform Mechanical Initialization to reset autoslide, Cycle power to Autoslide if problem persists, call Siemens.
ASL - Communications error	Failure	Communication lost between Analytical Module and Autoslide.	Check serial I/O cable between instrument and autoslide, and cycle autoslide power, perform a mechanical initialization.
ASL - Configuration / Parameter error	Failure	An invalid parameter was used to configure the Autoslide.	Perform Mechanical Initialization to reset autoslide, and report problem to Siemens.
ASL - Critical Error - Stop	Failure	General autoslide critical error (software error, unrecognized version, emergency stop, communications, bad parameter, EEPROM error, not initialized, sync error, sample may be diluted, hardware error, autoslide interface error, command timeout, command status...). Run stopped if Alarm/Stop criteria set.	Check message log for other errors, correct problem, reset autoslide - see Tip # 2.
ASL - Dispenser error	Failure	Mechanical problem on dispenser	Inspect dispenser area. Look for stuck or broken slide. Ensure sufficient slides are loaded to cover both slide sensors, proceed to Tip # 2
ASL - EEPROM error	Failure	EEPROM read or write error during initialization.	Call Siemens.
ASL - EEPROM IO error	Failure	An error occurred when reading or updating the EEPROM.	Perform Mechanical Initialization to reset autoslide, Cycle power to Autoslide if problem persists, and call Siemens.
ASL - Emergency stop cycle	Failure	Cover may have been opened while autoslide was busy.	Close cover, and reset autoslide. See Tips # 2 & 3.
ASL - Hardware error	Failure	A hardware error has occurred.	Check message log for other errors, correct problem, reset autoslide - see

			Tip # 2. Call Siemens.
Event Text	Severity	Probable Cause	Suggested Action
ASL - Impossible to rinse	Failure	Unable to rinse sample or drop deposit lines; Other command is processing.	Perform a mechanical initialization; If problem persists, call Siemens.
ASL - Internal software error	Failure	Software initialization problem or incorrect data entered.	Enter correct information; Run a mechanical initialization cycle. Call your Siemens Representative if not resolved.
ASL - Internal synchronization error	Failure	Autoslide internal synchronization error.	Perform a mechanical initialization. If problem persists, call Siemens.
ASL - Needle plate error	Failure	Staining needle positioning problem.	Open the covers and identify the problem. Close covers. Refer to Tips 2 & 3. If needles hitting slides, call Siemens.
ASL - Operation completed in error	Failure	Run Stopped - Autoslide command completed with an error.	Check Message Log - Detail screen for cause, correct and perform Mechanical Initialization.
ASL - Printer error	Failure	Printer ribbon not advancing or jammed.	Open front panel, inspect printer ribbon - clear jam or replace ribbon as needed. Ensure that there are no glass particles in the printer area. Run a Mechanical Initialization cycle. Cycle autoslide power if necessary.
ASL - Rack Error - Stop	Failure	General rack problem, could be low on racks.	Replenish racks in dispenser, check for jammed rack or full ejection tray. Run a reset smearer. (See Tips above)
ASL - Rack Handling error	Failure	Hardware failure in rack handler track.	Check for jammed racks or debris. Run a reset smearer. (See Tips above)
ASL - Slide Carrier error	Failure	Slide did not make it to the carrier in time, or loaded incorrectly.	Clear slide and inspect area for glass particles or debris then refer to Troubleshooting Tip # 2.
ASL - Smearing Error - Stop	Failure	Smearer door was open. Run stopped if Alarm/Stop criteria set.	Close smearer door, reset smearer (see Tip #2).
ASL - Smearing module door is open	Failure	Smearing module door is open.	Close the smearing module door, reset smearer if necessary.
ASL - Smearing module not primed	Failure	Smearing module is not primed.	Run prime smearer hydraulic cycle and reset smearer. Perform Daily Startup if necessary.

ASL - Smearing module not ready	Failure	Smearing module problem.	Reset smearer. Call Siemens.

Event Text	Severity	Probable Cause	Suggested Action
ASL - Smearing tape is loose	Failure	Smearing film empty, broken or incorrectly threaded.	Perform the smearing film replacement procedure. Be sure to check smearing wedge for cleanliness.
ASL - Stainer error	Failure	Stainer error.	Reset autoslide (see Tips # 2 & 3).
ASL - Stainer module door is open	Failure	Stainer module door is open.	Close the stainer module door. Perform a mechanical initialization, if necessary
ASL - Stainer not primed	Failure	Stainer is not primed.	Check message log to see if daily startup has been done, perform a daily startup or Stainer Prime (if daily startup was completed) followed by a mechanical initialization if necessary.
ASL - Stainer not ready	Failure	The stainer subsystem is not rinsed.	Reset autoslide.
ASL - Stainer under methanol	Failure	Stainer wells are full with methanol	Run the daily or weekly startup procedure to drain the methanol.
ASL - Staining Error - Stop	Failure	Stainer door was open. Run stopped if Alarm/Stop criteria set.	Close stainer door, reset autoslide, resume run.
ASL - Staining waste is full ASL - Staining Waste Full - Stop	Failure	Staining Waste is full - stainer enabled.	Dispose of staining waste according to local regulations; Perform a Reset Autoslide if necessary.
ASL - Unknown error	Failure	Autoslide reported an error unrecognized by the ADVIA 2120/2120i system.	Call Siemens.
ASL - In Pre-smeared slide mode	Information	An operation is rejected because STAT slide mode is in effect.	Wait for Stat slide to be completed, close manual slide entry door and try again.
ASL - Autoslide aspiration hardware unavailable on autosampler	Warning	The autosampler hardware for the second aspiration position is inoperable or unavailable	If system has a dual sampler, perform an autosampler reset. If not successful, power the ADVIA 2120/2120i system off/on. Call Siemens.
ASL - Autoslide is not available to make slides	Warning	Autoslide is not ready for use.	Perform daily/weekly maintenance as required, and try again.
ASL - Please Close manual door	Warning	Stat door is open.	Close the manual inlet /stat door.
Autoslide Command Error	Warning	Autoslide command error, or EEPROM failed.	Retry the command.

Event Text	Severity	Probable Cause	Suggested Action
Autoslide Daily Shutdown Incomplete	Warning	An error occurred that prevented the autoslide daily shutdown from completing.	Check message log for errors, correct any problems, and retry the daily shutdown. If still not successful, perform a Mechanical Initialization and then retry the daily shutdown.
Autoslide Daily Startup Incomplete	Warning	An error occurred that prevented the autoslide daily startup from completing.	Check message log for errors, correct any problems, and retry the daily startup. If still not successful, perform a Mechanical Initialization and then retry the daily startup
Autoslide is Processing Slides	Warning	Attempt was made to go to a configuration screen while slides were being processed.	Wait until all slides are completed before attempting to change configuration.
Autoslide Manual Inlet Door Cannot be Opened	Warning	The manual inlet door cannot be opened because the stainer is not enabled for use or the ADVIA 2120/2120i Autosampler is active.	Enable the stainer in the Autoslide options menu or stop Autosampler if appropriate, and try again.
Autoslide Manual Inlet Door Failed to Open	Warning	An error occurred while attempting to open the manual inlet door.	Check for something blocking the Stat door, and try again.
Autoslide operation cannot proceed as Compressor is Not Ready	Warning	Instrument is in standby, so compressor is off.	Take instrument out of Standby mode.
Autoslide Rejects Command Execution	Warning	The Autoslide is unable to execute the command at this time.	Action depends on the situation. Generally no action is required.
Autoslide Weekly Shutdown Incomplete	Warning	An error occurred during the weekly shutdown.	Check message log for other errors, correct problem, reset Autoslide, and repeat weekly shutdown.
Autoslide Weekly Startup Incomplete	Warning	An error occurred during the weekly startup.	Check message log for other errors, correct problem, reset Autoslide, and repeat weekly startup.
Autoslide Weekly Startup Needed	Warning	Weekly startup is now required.	Perform weekly startup.

Autoslide Specifications

The Autoslide is for indoor use only. Operation of the instrument at altitudes of over 2000 meters (6000 feet) is not recommended.

Throughput
Up to 108 slides per hour

Dimensions
Weight: 60 kg (approx.)
Width: 91 cm
Depth: 70 cm
Height: 50 cm

Operating Temperature Range
20 – 30°C

Relative Humidity
30 – 60%

Noise Level
65 decibels

Electrical Requirements
From 100V to 240V ± 10%
Maximum: 200 VA

Slide Requirements
super frost, rounded corner, ground edges
76 mm x 26 mm x 1 mm

Use slides provided by Siemens approved vendors *only*.

Sample Requirement
75 µL whole blood

Legal Information

LIMITED INSTRUMENT WARRANTY AND SERVICE DELIVERY POLICY .. 2

WARRANTY PERIOD 2
ADDITIONAL SERVICE PERIOD 2
SERVICE DURING NORMAL HOURS 3
EXTENT OF A SERVICE CALL 3
SERVICE OUTSIDE NORMAL HOURS 3
REPLACEMENT OF PARTS 3
DESIGN CHANGES AND RETROFITTING OF INSTRUMENTS 3
KEY OPERATOR DESIGNATION 4
OSHA REQUIREMENTS (US ONLY) 4

WARRANTY AND SERVICE EXCLUSIONS 4

CONTACT INFORMATION 5

SIEMENS AUTHORIZED REPRESENTATIVE 5

ADDRESSES 6

This section provides the following information:

- address of the Siemens authorized representative, which is the Siemens contact within the European community
- addresses for obtaining service and technical information and for ordering supplies
- system warranty and service delivery policy information

Limited Instrument Warranty and Service Delivery Policy

Siemens Medical Solutions Diagnostics and its authorized distributors may provide customers who acquire new Siemens instruments with a limited warranty either in a specific agreement or in standard language on their invoices. This limited warranty is designed to protect customers from the cost associated with repairing instruments that exhibit malfunctions due to defects in materials and/or workmanship during the warranty period.

Siemens Medical Solutions Diagnostics, at its election, provides warranty service either by providing repair service of the instrument on site, or by exchanging the defective instrument or component, subject to the limitations and exclusions set forth in *Replacement of Parts* and *Warranty and Service Exclusions* below. Repairs, replacements or exchanges of instruments or components provided during the warranty or any additional service period, does not extend the warranty or service period beyond the initially agreed upon period.

When the customer calls for service, the Siemens representative or authorized distributor informs the customer of the type of service available for the customer's instrument, and instructs the customer as to how to obtain that service.

Warranty Period

The limited warranty period generally commences upon installation of the original instrument at the customer's location and extends for a period of 1 year thereafter, unless otherwise specifically agreed to by and between Siemens Medical Solutions Diagnostics (or its authorized distributors) and customer in a writing signed by duly authorized representatives of both parties (sales representatives are generally not authorized representatives of Siemens for these purposes).

Additional Service Period

The customers, with some exceptions, may purchase additional service coverage beyond any initial warranty period as part of the original instrument acquisition for second or subsequent years beyond the original installation date. The customer's original Purchase Invoice or appropriate Agreement Addendum must indicate the term in months for additional service coverage.

Service During Normal Hours

The customer may obtain service for instruments during normal business hours by contacting the nearest Siemens Medical Solutions Diagnostics location or authorized distributor. Refer to the list of Siemens locations in this section.

Extent of a Service Call

Warranty or service calls generally include onsite repair or exchange of instruments or components, travel to the location of the instrument, and onsite labor during normal business hours. A warranty or service call is initiated by the customer by following the instructions on how to obtain service for the customer's instrument. The service call is considered complete when any defects in material or workmanship have been corrected by repair or replacement and the instrument conforms to the applicable specifications. When service is complete, the customer receives a copy of the documentation detailing all work performed by the Siemens Medical Solutions Diagnostics representative or authorized distributor.

Service Outside Normal Hours

Customers, with some exceptions, may also request service to be delivered or an exchange to be initiated outside normal business hours, including evenings, weekend days, or nationally observed holidays, by contacting the nearest Siemens Medical Solutions Diagnostics location or authorized distributor. Service performed outside normal hours is subject to a surcharge unless the customer has in place a service product option that provides service at the time requested.

Replacement of Parts

In performing service, Siemens Medical Solutions Diagnostics or its authorized distributors provide appropriate parts to repair the instrument, or arranges for the exchange of the instrument or affected parts, at no charge with the exception of certain parts or subassemblies that are considered Customer Maintenance Items. Customer Maintenance Items include, but are not limited to, the following items: lamps, electrodes or sensors (which are covered by a separate warranty), reagents, calibrators, controls, paper, and pens. Consult the appropriate system operator's manuals for a complete list of Customer Maintenance Items for any specific model of instrument.

Design Changes and Retrofitting of Instruments

Siemens Medical Solutions Diagnostics reserves the right to change the design or construction of specific models of instruments at any time without incurring any obligation to make such changes available to individual customers or instruments. If Siemens notifies customers of a change that improves the performance or reliability of their instrument, and requests to retrofit that instrument, the customer must agree to allow Siemens or an authorized distributor, at Siemens' expense, to retrofit components or make design changes, which does not adversely affect the instrument's performance characteristics.

Key Operator Designation

Each customer designates a key operator who is available to Siemens representatives to describe instrument malfunctions by telephone and/or to perform simple adjustments and corrections as requested. If a key operator is not designated or is unavailable when the customer requests service, the delivery of service may be delayed.

OSHA Requirements (US only)

When service is required at a customer location, the customer must provide the Siemens representative with adequate facilities that comply with the regulations of the Secretary of Labor under the Occupational Safety and Health Act (OSHA) of 1970, as amended.

Warranty and Service Exclusions

The following exclusions are in addition to any exclusions provided for in any written warranty or service agreement.

IF ANY OF THE FOLLOWING EVENTS OCCUR, THE WARRANTY OR SERVICE PROVISIONS DO NOT APPLY:

1. Repairs or modifications have been made to the instrument by someone other than an authorized Siemens Medical Solutions Diagnostics representative.
2. The instrument has been operated using accessories and supplies other than Siemens brand accessories, or consumable supplies and/or reagents not having the same grade, quality, and composition as defined in the system operator's manuals.
3. Siemens Medical Solutions Diagnostics has notified customers of a change that improves the performance or reliability of their instrument and customer has not agreed to retrofit or make design changes to the instrument.
4. Customer did not purchase the instrument from Siemens Medical Solutions Diagnostics or one of its authorized distributors.
5. The instrument has not been installed within 90 days of shipment to the customer's facility unless otherwise specified.
6. The customer has not performed appropriate customer maintenance procedures, as outlined in the system operator's manuals.
7. The instrument has been misused or used for a purpose for which it was not intended.
8. The instrument has been damaged in transit to the customer or damaged by the customer while moving or relocating it without supervision by a Siemens representative.
9. Damage was caused by floods, earthquakes, tornados, hurricanes, or other natural or man-made disasters.
10. Damage was caused by Acts of War, vandalism, sabotage, arson, or civil commotion.

11. Damage was caused by electrical surges or voltages exceeding the tolerances outlined in the system operator's manuals.
12. Damage was caused by water from any source external to the instrument.
13. The customer has purchased an alternative agreement whose terms of warranty or service supersede these provisions.

Siemens Medical Solutions Diagnostics or its authorized distributors can invoice customers, at current standard labor and parts rates, for instruments repaired to correct damage or malfunctions due to any of the reasons listed above.

OTHER THAN AS STATED ABOVE, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE INSTRUMENT, ITS SALE TO THE CUSTOMER, ITS LEASE TO THE CUSTOMER, OR THE SALE OF THE INSTRUMENT TO THE CUSTOMER AT THE EXPIRATION OR TERMINATION OF THE LEASE AGREEMENT.

SIEMENS MEDICAL SOLUTIONS DIAGNOSTICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. SIEMENS MEDICAL SOLUTIONS DIAGNOSTICS' LIABILITY FOR BREACH OF ANY WARRANTY OR SERVICE AGREEMENT SHALL BE LIMITED ONLY TO THE REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT AND SHALL NOT INCLUDE ANY DAMAGES OF ANY KIND, WHETHER DIRECT, INDIRECT, INCIDENTAL, CONTINGENT, OR CONSEQUENTIAL. SIEMENS SHALL NOT BE LIABLE FOR DELAY FROM ANY CAUSE IN PROVIDING REPAIR OR EXCHANGE SERVICE.

ANY LIMITATIONS OR OTHER PROVISIONS NOT CONSISTENT WITH APPLICABLE LAW IN PARTICULAR JURISDICTIONS OR A SPECIFIC WRITTEN AGREEMENT DO NOT APPLY TO CUSTOMERS IN THOSE JURISDICTIONS OR SUBJECT TO THOSE AGREEMENTS.

Information for Technical Assistance

Refer to the procedures in this appendix to provide system information that you may need when you call for technical assistance.

Contact Information

This section provides the following information:

- the address of the Siemens authorized representative, which is the Siemens contact within the European community
- the Siemens addresses for obtaining service and technical information and for ordering supplies

Siemens Authorized Representative

Siemens Medical Solutions Diagnostics Europe Limited
Chapel Lane, Swords, Co. Dublin, Ireland

Addresses

For technical assistance contact your local technical support provider. For customer service or additional information contact your local technical support distributor.



Siemens Medical Solutions Diagnostics
Tarrytown, NY 10591-5097 USA

EC REP

Siemens Medical Solutions Diagnostics
Europe Limited
Chapel Lane, Swords, Co. Dublin, Ireland

Siemens Medical Solutions
Diagnostics Pty Ltd
ABN 65 007 436 651
885 Mountain Highway
Bayswater Victoria 3153
Australia

シーメンスメディカルソリューションズ・
ダイアグノスティクス株式会社
東京都品川区東五反田 3-20-14
(Siemens Medical Solutions Diagnostics)

輸入

Warnings and Safety Information

WARNINGS **2**

SAFETY INFORMATION **3**

REGULATORY COMPLIANCE **3**

STANDARDS OR REGULATIONS 3
CE MARK REQUIREMENTS 3
NOISE-LIMIT REQUIREMENT 4

DOCUMENTATION **4**

SYSTEM SYMBOLS **4**

INTERPRETATION OF RESULTS **9**

EXPLANATION OF THE WARNING LABELS ON THE AC POWER BOX **10**

EXPLANATION OF THE WARNING LABELS ON THE MANUAL CLOSED-TUBE SAMPLER **11**

PROTECTING YOURSELF FROM LASERS **12**

RBC LASER OPTICAL ASSEMBLY 12
AUTOSAMPLER BARCODE READER 13

Warnings



ELECTRICAL WARNING

To avoid exposure to shock hazards and/or damage to the instrument while performing this procedure, power off the analyzer before proceeding.



BIOHAZARD

All products or objects that come in contact with human or animal body fluids should be handled, before and after cleaning, as if capable of transmitting infectious diseases. Wear facial protection, gloves, and protective clothing.

The operator should follow the recommendations to prevent the transmission of infectious agents in health-care settings as recommended by the Clinical and Laboratory Standards Institute (formerly NCCLS) in *Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition.* 2005. CLSI Document M29-A3. This document contains complete information on user protection and it can be used as reference material for instructions on laboratory safety.



LASER WARNING

To avoid damage to the eyes, never look directly at the laser beam or at its reflection from a shiny surface. All field service procedures must be followed precisely. Only Siemens-trained field service personnel should perform procedures related to laser assemblies.

For more safety information and laser specifications, refer to **Safety Information, Protecting yourself from lasers**.



WARNING

When handling **EZ KLEEN**, wear protective clothing, gloves, and safety glasses. It is harmful if swallowed and may cause eye or skin irritation.



WARNING

Regular strength household bleach is 5% sodium hypochlorite. Extra-strength household bleach is 6% sodium hypochlorite. Either strength may be used with the ADVIA 2120/2120i Hematology System. When handling bleach, which can be used as a cleaning and antiviral agent, wear protective clothing, gloves, and safety glasses. It is harmful if swallowed and may cause eye or skin irritation.

Use household bleach that is free of heavy metals, such as Clorox.

To prepare a 25% solution of household bleach, dilute one part of bleach with three parts of clean distilled water, or clean deionized water. The prepared solution is stable for one week when stored at room temperature.

Safety Information

Safety features have been incorporated into the ADVIA 2120/2120i system to protect the operator from injury, the analyzer from damage, and the test results from inaccuracies.

Regulatory Compliance

Standards or regulations

The ADVIA 2120/2120i conforms to the following safety standards or regulations:

EN61010-1: 1993	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1
EN60825-1	Safety of Laser Products; Part 1
UL 3101-1	Electrical Equipment for Laboratory Use; Part 1: General Requirements.
CAN/CSA C22.2 No. 1010.1 - 92	Safety requirements for Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements
CFR 47: Chapt. 1 FCC Subpart B Part 15.103 Exempted Devices (C) Part 15.105 (A)	This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

CE mark requirements

The ADVIA 2120/2120i conforms to the following standard. It therefore meets the EMC conformity requirements for “CE” marking according to the European IVDD Directive 98/79 EC.

EN 61326-1 1997+ A1:1998 + A2:2001 (Class "A")	Electrical Equipment for measurement, control, and laboratory use - EMC requirements

Noise-limit requirement

The ADVIA 2120/2120i conforms to the following noise-limit requirement:

EN27779: 1989 Measurement of Airborne Noise Emitted By Computer and Business Equipment (61 dBA)

Documentation

In the printed and online documentation, all hazards (except those associated with reagents) are categorized as follows:

WARNING Indicates the risk of personal injury or loss of life if operating procedures and practices are not correctly followed.

CAUTION Indicates the possibility of damage to or destruction of equipment if operating procedures and practices are not strictly observed.

IMPORTANT Indicates that system functions, including test results, may be adversely affected if operating procedures and practices are not correctly followed.

Hazards associated with the presence, handling, or use of required reagents are categorized as follows:

CAUTION ! Indicates a hazard that could cause illness, burns, skin reactions, and so on. Substances such as diluted acids, mild caustics, minor skin irritants, and combustible materials are assigned to this category.

ATTENTION Indicates that a specific risk exists to the user or performance.

Refer to the labels on the reagent containers and to the Material Safety Data Sheets for information about the hazards and precautions associated with the reagents.

System Symbols

This section describes the symbols that can appear on the exterior of the ADVIA 2120/2120i system or on the system packaging. The symbols on the system provide you with the location of certain components and with warnings for proper operation. The symbols on the system packaging provide you with other important information.

Warnings and Cautions



- A Warning indicates the risk of personal injury or loss of life if operating procedures and practices are not correctly followed.
- A Caution indicates the possibility of loss of data or damage to or destruction of equipment if operating procedures and practices are not strictly observed.



When this symbol appears on the system without additional information, you must consult the instructions for use.



Biohazard.

The biohazard warning label mounted on the front of the analyzer alerts you to the possibility of exposure to a biohazard during the sampling process or through contamination of the analyzer.



This symbol identifies a product that may contain an infectious agent.



This symbol alerts you to a potentially harmful substance.



These symbols together alert you to a waste biohazard.



Laser hazard



Electrical hazard



This symbol indicates an *in vitro* diagnostic device or an *in vitro* diagnostic medical device.



This symbol indicates that you should consult the operating instructions for necessary information.

REF	This symbol indicates the number used for ordering a part or product.
SN	This symbol indicates the serial number of a part or product.
LOT 製造番号	This symbol indicates the batch code for a product.
	This symbol indicates the name and location of the product manufacturer.
	This symbol indicates the date of manufacture of the product.
EC REP	This symbol indicates the manufacturer's authorized representative within the European community.
CE	This symbol indicates that the product complies with the applicable directives of the European Union.
UL LISTED Laboratory Equipment 26JA	This symbol indicates that the product is UL approved for safety (United States).
NRTL/C UL-3101-1	This symbol indicates that the product is CSA approved for safety (Canada).
TIC	This symbol indicates that the colorimeter conforms with DIN standard 58 960 developed by the Working Committee on Photometers of the Standards Committee on Medicine (NAMed) in the DIN Deutsches Institute für Normung e.V.
Class 1 Laser Product	This symbol indicates that the product is a Class 1 laser product, with no laser exposure during normal operation.
	This symbol indicates that the product is a Class 2 laser product, with potential exposure to a laser beam.
	This is the On symbol.
	This is the Off symbol.



This is the Start symbol.



This is the Standby symbol.



This symbol indicates the switch position for normal system operation of the waste container.



This symbol indicates the switch position for emptying the waste container.



This symbol indicates the need to empty the waste container.



This symbol indicates the open and closed positions for a spigot.



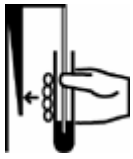
This symbol indicates liquid waste.



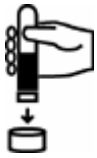
This symbol indicates pressure. In this example, the symbol indicates 20 PSI.



This symbol indicates vacuum. In this example, the symbol indicates a vacuum of 20" Hg.



This symbol indicates the manual open-tube sampler.



This symbol indicates the manual closed-tube sampler.



This symbol indicates that there is a rack in the sampler.



This is the eject rack symbol.



This is the network symbol.



This is the monitor symbol.

This symbol indicates the maximum level.



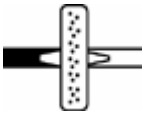
This is the knob symbol.



This is the fuse symbol.



This is the filter symbol.



This is the vacushield symbol.



This is the CPU symbol.



This symbol indicates a protective terminal.



This is the barcode scanner symbol.



This symbol indicates that moving the component can cause injury.



This symbol identifies a product that contains recyclable material.



This symbol indicates the top of the package.



This symbol indicates the acceptable temperature range for storage of the product.

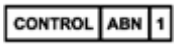


使用期限

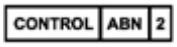
This symbol identifies the date by which the product should be used.



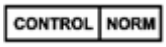
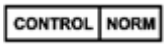
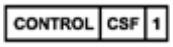
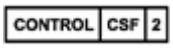
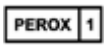
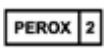
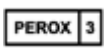
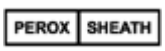
This is the Setpoint Calibrator symbol.



This is the TESTpoint 3-in-1 Hematology Control Abnormal 1 symbol.



This is the TESTpoint 3-in-1 Hematology Control Abnormal 2 symbol.

	This is the TESTpoint 3-in-1 Hematology Control Normal symbol.
	This is the TESTpoint High Control symbol.
	This is the TESTpoint Low Control symbol.
	This is the TESTpoint Normal Control symbol.
	This is the CSF Control 1 symbol.
	This is the CSF Control 2 symbol.
	This is the ADVIA RETIC High Control symbol.
	This is the ADVIA RETIC Low Control symbol.
	This is the DEFOAMER symbol.
	This is the EZ KLEEN symbol.
	This is the BASO Reagent symbol.
	This is the CSF Reagent symbol.
	This is the HGB Reagent symbol.
	This is the CN-FREE HGB Reagent symbol.
	This is the PEROX 1 Reagent symbol.
	This is the PEROX 2 Reagent symbol.
	This is the PEROX 3 Reagent symbol.
	This is the PEROX SHEATH symbol.
	This is the RBC/PLT Reagent symbol.
	This is the SHEATH/RINSE symbol.

Interpretation of Results

System operators and laboratory supervisors are responsible for operating and maintaining Siemens products in accordance with the procedures described in the applicable Product Labeling (online documentation, package inserts, bulletins), and for determining that product performance conforms to the applicable claims.

If, under these prescribed conditions of operation and maintenance, an aberrant or abnormal result, as defined by the laboratory protocol, occurs, laboratory personnel should first make certain that the system is performing and is being operated in accordance with the Product Labeling; then follow the laboratory protocol for advising the clinician of a result that appears to have deviated from the norms established by the laboratory.

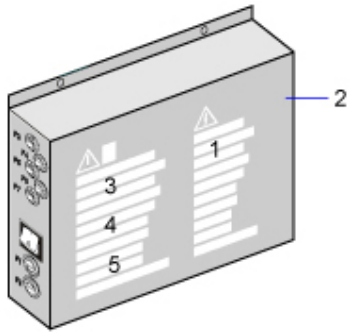
Siemens products do not make diagnoses on patients. Siemens intends its diagnostic products (systems, reagents, software, hardware) to be used to collect data reflecting the patient's chemical, hematological, or immunological status at a certain point in time. Such data must be used in conjunction with other diagnostic information and with the attending physician's evaluation of the patient's condition to arrive at a diagnosis and a clinical course of treatment.

Any malfunction of a Siemens diagnostic product (for example, failure to meet a performance specification or to perform as intended) should be appropriately addressed by laboratory personnel. Various sections of the Product Labeling address malfunctions and their possible effect on results.

Explanation of the warning labels on the AC power box

1 The AC power box must be opened by qualified personnel only. The only operator serviceable parts in the AC power box are fuses F1 through F7, which are replaced without opening the module.

2 The two electrical outlets on the side of the AC power box are intended only for the computer and monitor supplied with the system. These outlets are designed to ensure proper operation of the system devices and to maintain the system safety certifications. Do not connect other devices to them.



AC power box location

3 Since electrical power is still applied to some system components even after the power switch is turned off, you must unplug the main power before servicing the system (for example, when replacing fuses).

4 Always replace fuses F1 and F2 at the same time. Any high-current event that causes one of these fuses to fail can damage the other one and shorten its service life.

5 Always replace a fuse with one of the same type and rating. If the fuse label is missing or illegible, refer to the fuse information table. Be sure to select the fuse requirements appropriate for your system's input voltage.

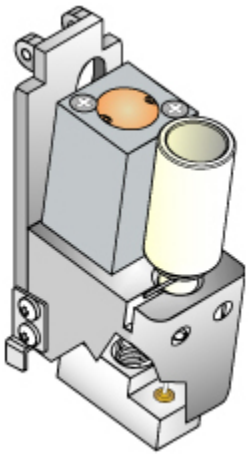
Explanation of the warning labels on the manual closed-tube sampler

Sampler Door



Never put your finger into the manual closed-tube sampler centering collar.

Manual Closed-Tube Sampler



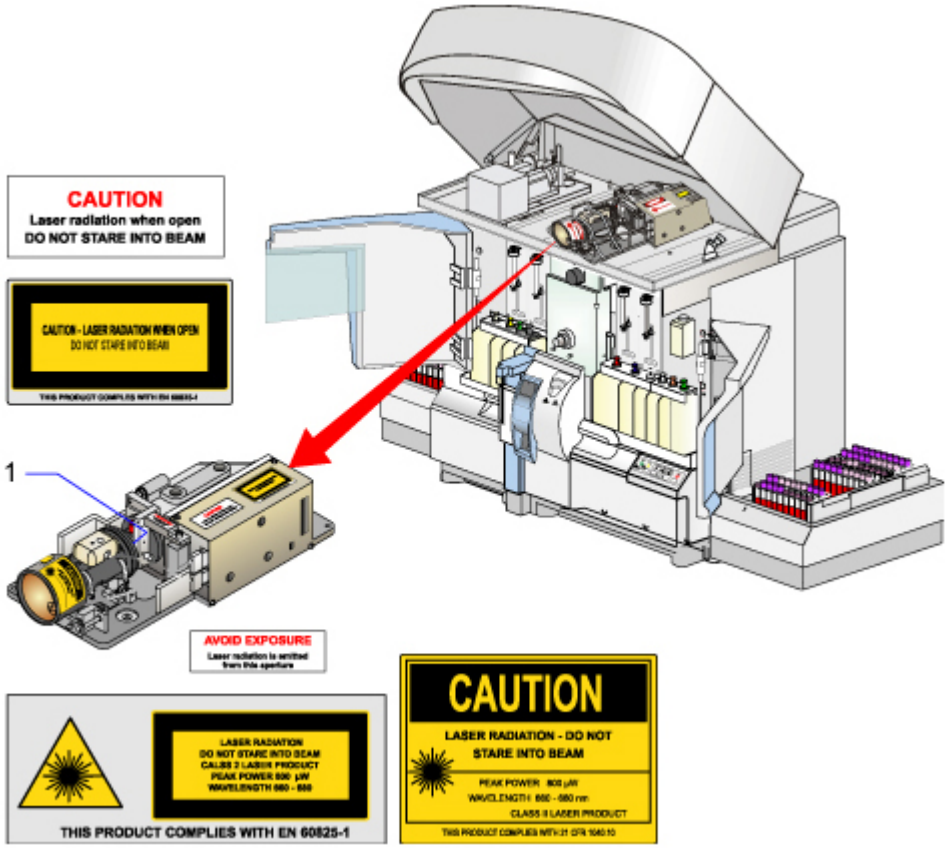
To avoid injury when removing or replacing the manual closed-tube sampler needle or centering collar, the system must be off. You must place a protective cover over the needle immediately after removing the centering collar.

Protecting yourself from lasers

The ADVIA 2120/2120i Hematology System is classified as a Class I laser product as defined by the National Center for Devices and Radiological Health (CDRH) regulations 21 CFR 1040 and by EN-60825.

RBC laser optical assembly

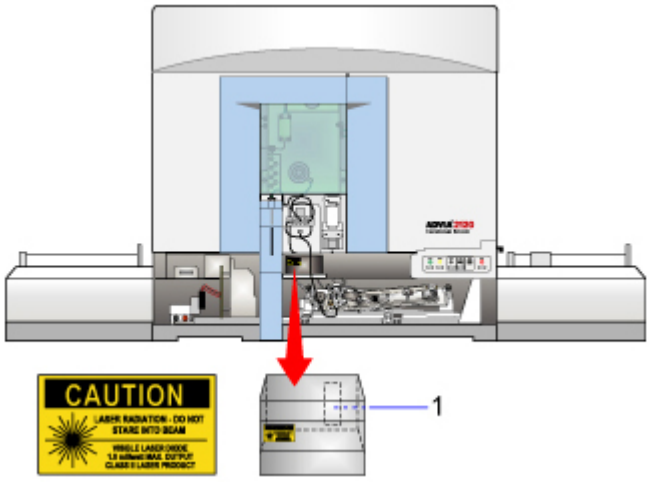
The RBC laser optical assembly is classified as a Class II laser device which has a maximum power output of 800 µW at 670 nm (nominally) and a continuous wave output. The RBC laser assembly is set internally to have a maximum output of 290 ±58 µW. The laser beam path is enclosed in a series of non-interlocked protective housings that prevent human access to laser radiation during operation and maintenance of the laser product.



1 Laser aperture

Autosampler Barcode Reader

The autosampler barcode reader is classified as a Class II laser device. It has a maximum power output of 1 mW at a wavelength of 670 nm, a pulse duration of 90 ns, and 3.6 mr units of beam divergence.



1 Laser aperture in back of barcode reader

LASER WARNING

Some field service procedures require the removal of the protective housings that prevent human access to the laser radiation. All field service procedures must be followed precisely to prevent possible eye injury from the laser radiation. Only Siemens-trained field service personnel should perform procedures related to the ADVIA 2120/2120i laser optics bench.

Laser Hazard Precautions

The following list of precautions must be observed when servicing the ADVIA 2120/2120i laser optics:

- Remove all jewelry from hands and wrists.
- Do not look directly at the laser beam.
- Do not look at specular reflections from the laser beam.
- Do not place reflective objects, such as screwdrivers or jewelry, into the beam path.
- Always ensure that the laser beam is terminated with a beam stop.

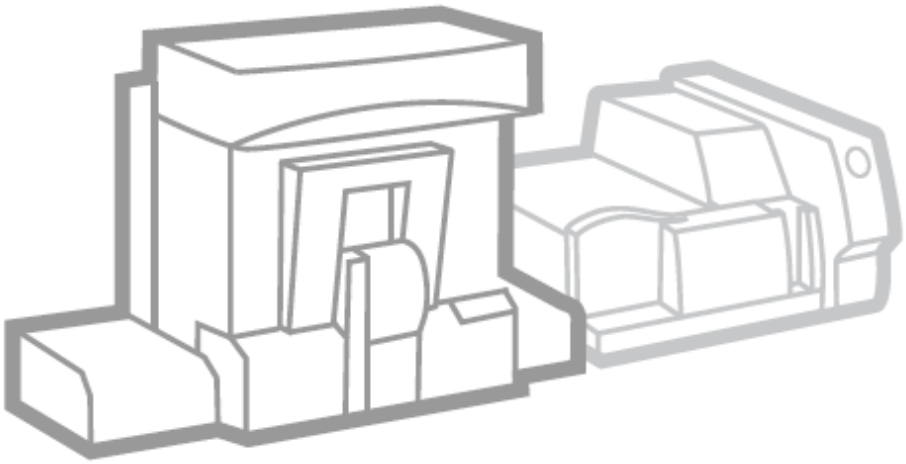
“西門子” 血液分析系統
ADVIA Hematology System

ADVIA 2120i 血液分析儀
ADVIA 2120i Hematology System

限由醫檢師及醫師使用

衛署醫器輸字第　015538　號

操作手冊



067D0157-01 修訂 B 版，2008 年 3 月

CE

SIEMENS

目錄

目錄 1

歡迎使用 ADVIA® 2120/2120i 血液分析儀 1-1

概述 1-2
組件 1-3
ADVIA 2120/2120i 血液分析儀工作原理 1-13
ADVIA 2120/21201 軟體工作原理 1-14
結果 1-17
規格 1-18

打開/關閉系統 2-1

概述 2-2
打開系統 2-2
關閉系統 2-4

日常程序 3-1

開始每個批次 3-2
處理檢體 3-5
結束每個批次 3-10

維護分析儀 4-1

時間表 4-2
系統清洗 4-3
清洗定心環 4-4
清潔 UFC 中的分血閥和吸取通道 4-7
清潔分血閥 4-7
檢查並清潔注射器推筒 PN 067-506-01 和 PN 067-506-02 4-10
更換進樣器針 4-13
更換鞘液過濾器 4-15
更換 50 或 1000µL 的注射器推筒 PN 067-506-01 和 067-506-02 4-16
清潔空氣循環過濾器 4-19
檢查 PEROX-CAP 通氣孔中是否存在殘留物質 4-19
清潔自動進樣器吸取裝置 4-20

分析儀故障排除 5-1

校正和調整 5-3
清潔過程 5-6
修理與更換 5-26
故障排除技巧 5-48

警示 6-1

形態學警示 6-3
檢體／系統警示 6-20

狀態列訊息 7-1

方法 8-1

嗜鹼性顆粒細胞／分葉核方法 8-3
腦脊液 CSF 方法 8-16
血紅素方法 8-21
過氧化物酶染色方法 8-25
紅血球／血小板方法 8-38
網狀紅血球方法 8-57

管制資訊 9-1

方法說明 9-4
NCCLS (GP2-A) 號文件和 SIEMENS 方法主題交叉參考 9-16
CBC 方法 9-19
CSF 方法 9-30
WBCDIFF 方法 9-40
網狀紅血球方法 9-48
方法數據摘要 9-56

ADVIAAUTOSLIDE©製片染片機 10-1

概述 10-3
AUTOSLIDE 安全訊息與警告 10-7
操作原理 10-9
AUTOSLIDE 日常程序 10-11
AUTOSLIDE 操作 10-11
裝載試劑 10-11
裝載玻片架 10-12
裝載玻片 10-12
清空染色劑廢液容器 10-13
手動運行日常啓動過程 10-13
手工命令執行推片 10-15
對手動塗片的玻片進行染色 10-15
重新設置 AUTOSLIDE 模組 10-16
停止 AUTOSLIDE 模組（FAST STOP（快停）) 10-16
手動運行日常關機過程 10-16
斷開 AUTOSLIDE 90°配置 10-16
AUTOSLIDE 染色法 10-20
定期維護 10-37
錯誤消息與建議操作 10-47
AUTOSLIDE 規格 10-51

法律資訊 A-1

分析儀有限保修和服務交付政策 A-2
保修和服務排除條款 A-3
聯繫訊息 A-4
SIEMENS 公司授權代表 A-5

警告和安全資訊 B-1

警告 B-2
安全資訊 B-3
法規規範 B-3
文檔 B-4
系統符號標識 B-4
結果的解釋 B-9
交流電源盒上警告標籤的說明 B-10
手動閉管進樣器上警告標籤的說明 B-11
防止受到激光傷害 B-12

歡迎使用 ADVIA® 2120/2120i 血液分析儀

概述 2

組件 3

自動進樣器 4
手動閉管和開管進樣器 5
集成流路系統(UFC) 5
光學裝置 7
檢體、鞘液和膜泵 9
試劑、鞘液／沖洗液、洗液以及除泡劑 10
真空和壓力調節器旋鈕 11
觸控板 11
觸摸屏 11
手動條碼閱讀器 12
廢液處理系統 12

ADVIA 2120/2120i 血液分析儀工作原理 13

ADVIA 2120/2120i 軟體工作原理 14

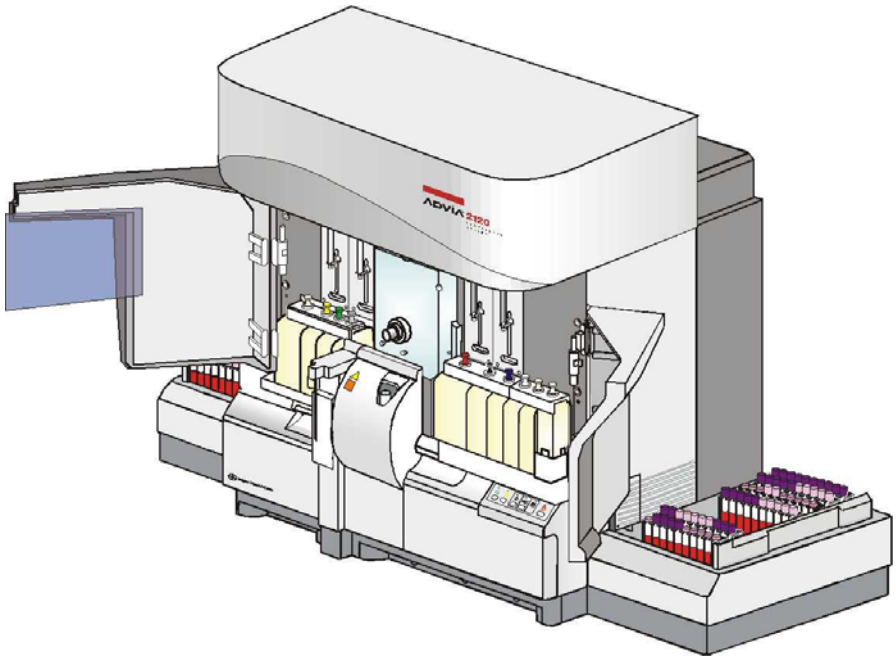
狀態欄 14
菜單 15
選項鍵 15
左側按鈕 15
主顯示區 15
底部按鈕 16
幫助按鈕 16
快速鍵 16
嚮導 16
列印螢幕 16

結果 17

規格 18

自動進樣器 18
數據管理 18
參數 19
性能規格 20
個人計算機技術規格（最低要求） 20
物理規格 21
檢體模式容量 22
測試選擇／處理速度 22

概述



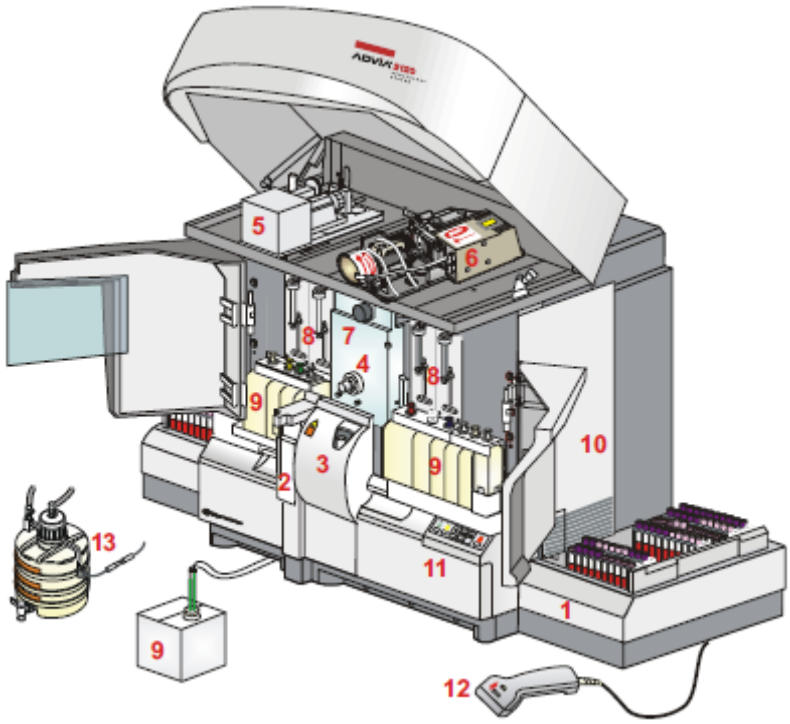
ADVIA® 2120/2120i 血液分析儀是一台全自動診斷儀器，其處理速度每小時高達 120 個檢體(CBC/diff)。本分析儀使用全血檢體提供下列結果：

- 全血細胞計數(CBC)
- 全血細胞計數加白細胞分類計數(CBC/diff)
- 網狀紅血球計數：絕對值、百分比和指數計數(retic)
- 全血細胞計數、白細胞分類計數以及網狀紅血球計數(CBC/diff/retic)
- 全血細胞計數／網狀紅血球計數

組件

ADVIA® 2120/2120i 血液分析儀包括兩個主要組件：

- 本分析儀包含所有電動、氣動、液壓和進樣器裝置，還包括除鞘液／沖洗液以外的存儲所有試劑、除泡劑以及沖洗液的機載裝置。本分析儀還具有廢液處理系統。



1 自動進樣器

2 手動開管進樣器

3 手動閉管進樣器

4 集成流路板技術

5 過氧化物酶反應光學組件

6 紅血球光學組件

7 血紅素光度計組件

8 檢體、鞘液和膜泵

9 試劑、鞘液、洗液和沖洗液

10 真空和壓力調節器旋鈕

11 觸控板

12 手動條碼閱讀器

13 廢液處理系統

- 個人計算機包括顯示器、滑鼠、鍵盤和連接電纜。

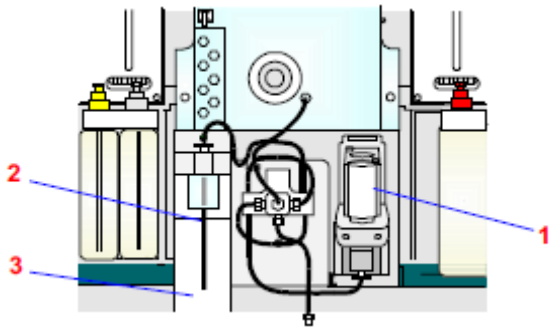
自動進樣器

自動進樣器會自動傳送、混合、識別並吸取閉管中的檢體。

自動進樣器是一個樣品架式進樣器，可容納 150 管檢體：15 個樣品架，每架 10 管。每個樣品架都帶有條碼，標示不同的架數和位置號。

採血管尺寸(mm) 直徑 X 高度	廠商	吸樣量(mL)	最小容量 需要的死腔量(mL)
10 X 50	Becton-Dickinson VACUTAINER	--	0.6

手動閉管和開管進樣器



單個檢體和急診一檢體從手動進樣器中吸取。

從閉管中吸樣時，帶蓋樣品管倒置並插入定心環(1)。插入採血管所產生的向下壓力會推動針向上，刺穿瓶蓋，然後吸取出檢體。

從開管中吸取時，檢體針(2)會插入檢體中。按下吸液板(3)即可取樣。

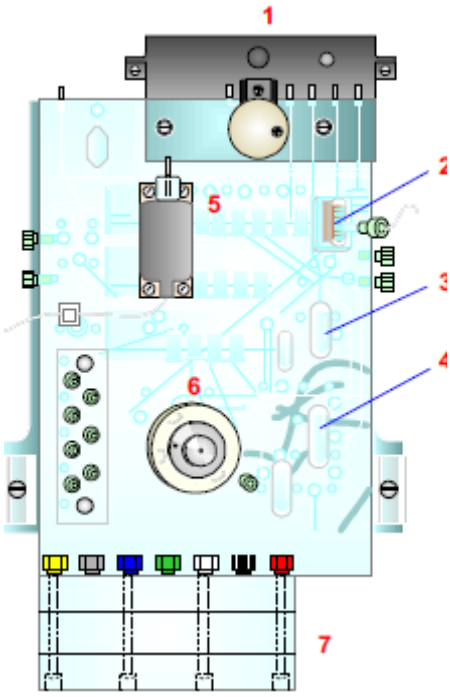
在開始吸取檢體之前，由手動條碼閱讀器輸入或者從 Manual Sample ID（手動檢體 ID）選項中識別檢體和請求的測試類型。

集成流路系統(UFC)

UFC 裝置採用 Unifluidics™ 技術。

UFC 裝置由 8 片丙稀酸板組成。這些丙稀酸板組成液路和氣路通道、閥門以及四個反應池。過氧化物酶反應池安裝在 UFC 裝置的外表面上。

試劑泵裝置安裝在 UFC 裝置底部，同樣是丙稀酸材質。該泵包括 1 個隔膜以及 7 個充當隔膜的單獨泵區，使試劑進入反應池。



1 血紅素反應池（不可見）

2 嗜鹼性粒細胞反應池

3 紅血球反應池

4 網狀紅血球反應池

5 過氧化物酶反應池

6 分血閥

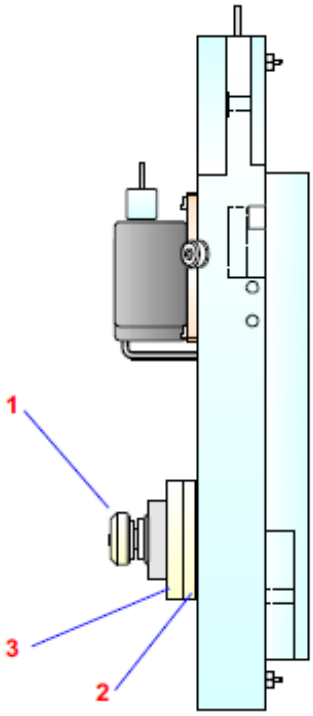
7 試劑泵裝置

分血閥

分血閥(1)由兩個陶瓷片組成。後片(2)是固定的。前片(3)可旋轉，將檢體”剪切”或分爲適當的等分檢體以供分析。

前片還可以旋轉以進行吸取，直接進行細胞分析。

(UFC 側視圖)



反應池

反應池是 UFC 裝置中的機制容器，在其中混合檢體和試劑並發生細胞化學反應。

共有 5 個反應池。

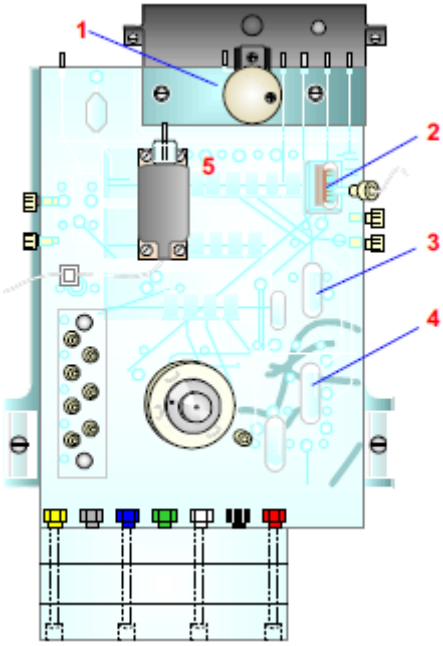
1 血紅素反應池（不可見）

2 嗜鹼性粒細胞反應池

3 紅血球反應池

4 網狀紅血球反應池

5 過氧化物酶反應池



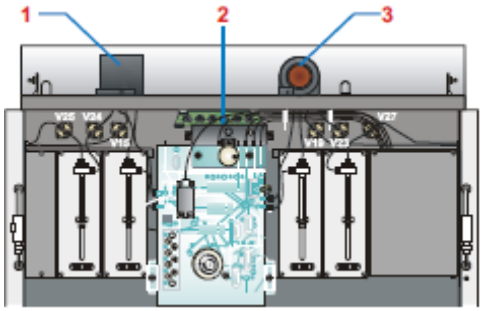
過氧化物酶反應池(5)受溫度控制。將混合檢體和三種試劑，即 PEROX 1、PEROX 2 和 PEROX 3 加熱以發生需要的細胞化學反應。

嗜鹼性粒細胞／分葉核反應池(2)是溫度控制。將混合的檢體和試劑加熱以發生需要的細胞化學反應。

血紅素反應池(1)作爲光學比色杯，在其中讀取血紅素測量結果。

紅血球／血小板以及網狀紅血球反應池(3)和(4)作爲混合試劑和檢體的容器，在其中發生需要的細胞化學反應。

光學裝置



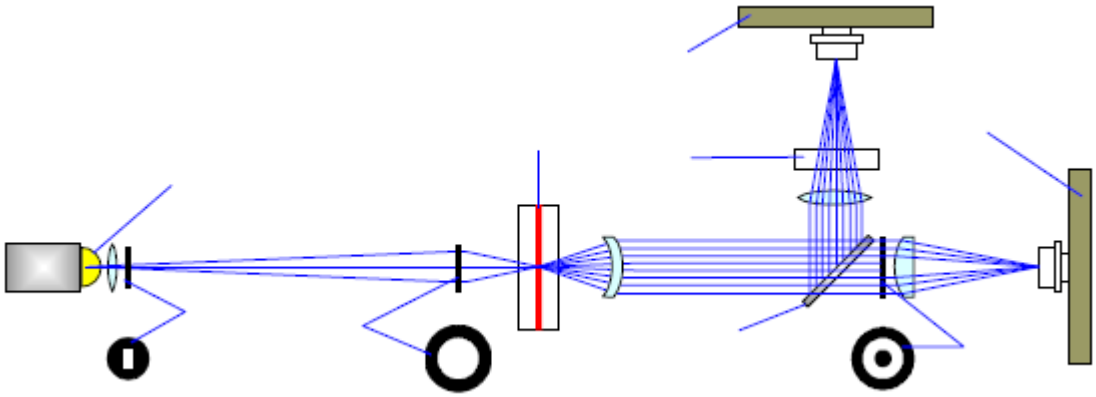
過氧化物酶反應光學裝置(1)
通池。通過在流通池中使用鞘流，可以逐個細胞地測量光散射和吸收率。

血紅素光度計裝置(2)根據通過反應池的傳輸光數量獲取電壓讀數。
分析儀使用讀數得出血紅素濃度。

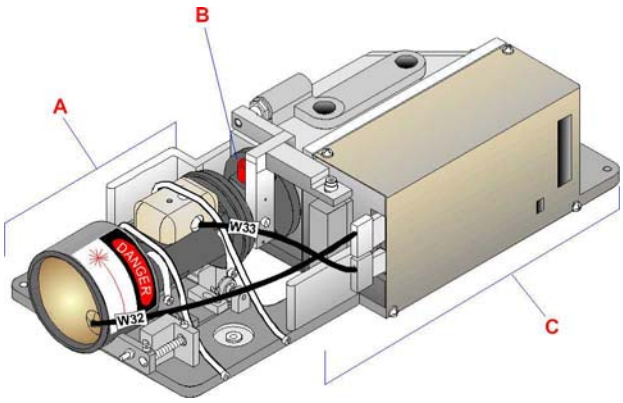
激光光學裝置(3)使用激光二極管作爲光源。血紅素／血小板、網狀紅血球以及嗜鹼性粒細胞／分葉核通道共用此光學裝置。通過在流通池中使用鞘液流，可以逐個細胞地測量小角度和大角度的光線散射率和吸收率。

過氧化物酶反應光學裝置

過氧化物酶反應光學裝置用於測量鎢燈光束通過流通池中準備好的白細胞流時的散射率和吸收率。



激光光學系統



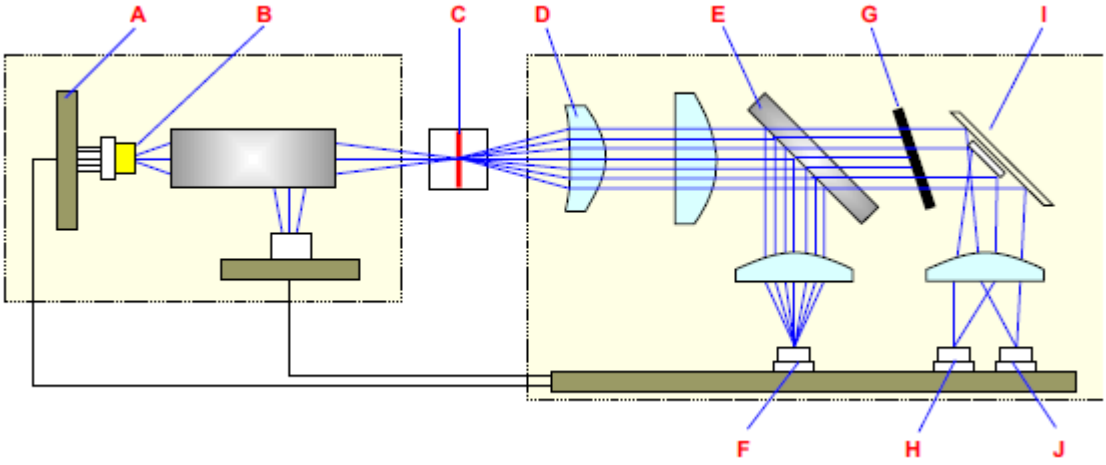
A 照明裝置
B 流通池位置
C 檢測裝置

激光光學系統由照明裝置、流通池裝置和檢測器裝置組成。照明裝置中的激光二極管用作光源。

激光二極管所發出光線照亮的隙縫影像聚焦到流通池。流通池中的檢體／鞘流包含等體積球形化紅血球(RBC)。

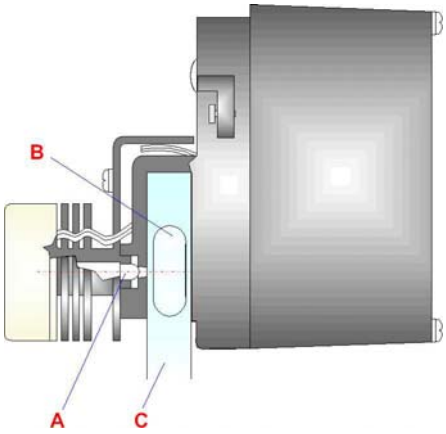
通過流通池中縫隙影像的紅血球和網狀紅血球散落在低和高角度處；染色網狀紅血球還會吸收一定量的光線。散射的光線由兩個散射光電二極管檢測後生成下列信號：

- 高角度散射信號與散射在 5˚到 15˚角度之間區域的光線對應。
- 低角度散射信號與散射在 2˚到 3˚角度之間區域的光線對應。



A 激光二極管驅動板
B 激光二極管
C 檢體流
D 高 NA 鏡
E 分光稜鏡
F 吸收檢測器
G 不對稱暗視野光擋
H 低角度散射檢測器
I 光束分離器
J 高角度散射檢測器

血紅素光度計裝置



A 燈裝置　　B 血紅素反應池　　C UFC 裝置

血紅素光度計裝置跨放在 UFC 裝置(C)的項部。

光度計包括一個設置爲 3.5 Vdc 的光源(A)，一個 565 nm 或 546 nm 的干擾濾波器（具體取決於所選的血紅素方法）。

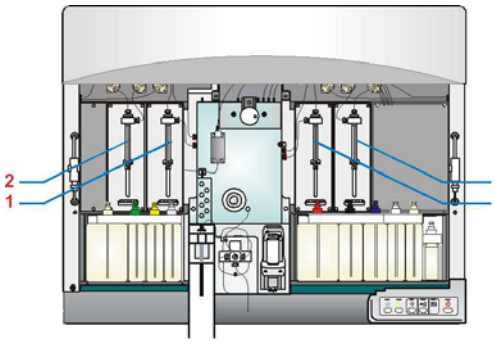
血紅素反應池(B)安裝在 UFC 裝置內部。

使用基準值以及在血紅素檢體分析的特定間隔得到的檢體讀數計算血紅素派度。

當反應池中裝有試劑或沖洗液的混合檢體時，這些電壓讀數與通過反應池的傳輸光線數量相對應。

然後，血紅素接口板會將電壓讀數轉換爲數字格式並發送到分析儀 CPU，以計算光密度並進而得出血紅素濃度。

檢體、鞘液和膜泵



過氧化物酶反應檢體(1)和鞘液(2)泵位於分析儀的左側。

紅血球／嗜鹼性粒細胞／網狀紅血球檢體(3)和鞘液(4)泵位於分析儀的右側。

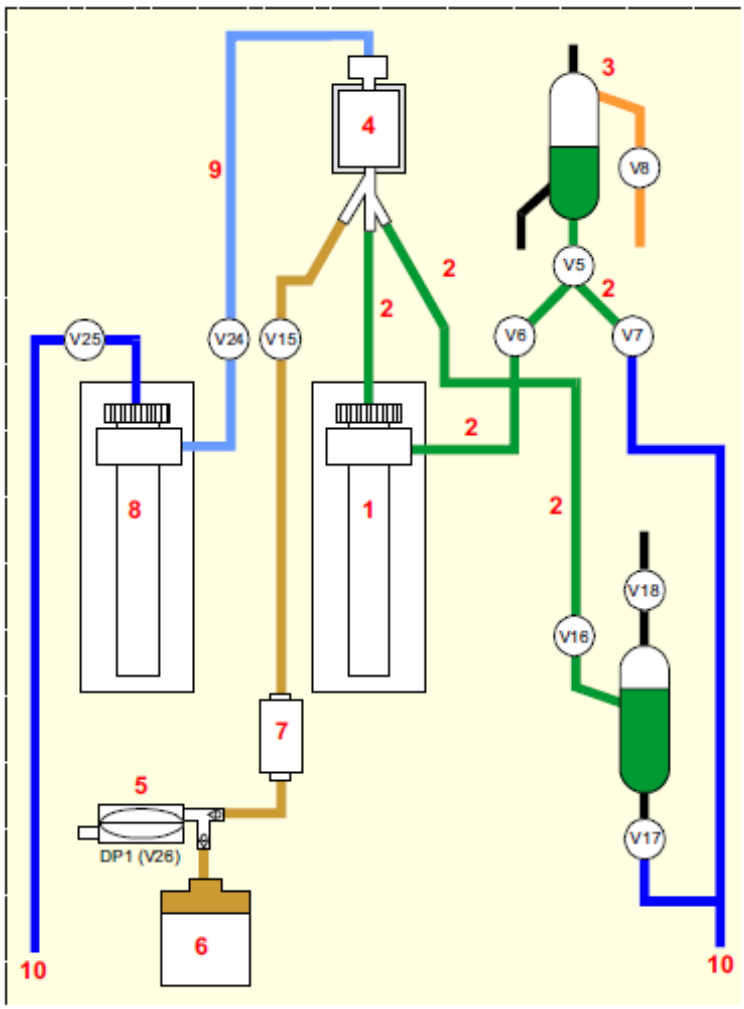
鞘液、沖洗液和洗液（共 5 種）的膜泵位於試劑容器的上方。

檢體泵(1)將精確數量的已反應檢體(2)從適當反應池(3)輸送到流通池(4)中。

鞘液膜泵(5)將鞘液(6)通過鞘液過濾器(7)直接輸送到流通池中。

鞘液泵(8)將 PEROX 鞘液、鞘液／沖洗液和已反應的檢體流(9)送過流通池以進行分析。

所分析的檢體和鞘液流入廢液系統(10)，然後洗滌和沖洗輸送管、流通池和反應池。



試劑、鞘液／沖洗液、洗液以及除泡劑

試劑 檢體混合以便進行細胞化學分析和測量。

鞘液 在檢體流過光學裝置時裹住檢體流，確保逐個細胞進行分析。

沖洗液 在分析完每個檢體後清潔液壓通道和反應池，防止殘留檢體並確保結果的可靠性。

洗液 去除液壓通道中殘留的物質。應當定期清洗系統。每天一次，或在處理特定數量的檢體後清洗。

除泡劑 去除廢液容器中的泡沫積聚。

洗液、PEROX 鞘液、除泡劑以及所有細胞化學試劑均存放在分析儀上，但鞘液／沖洗液和除泡劑除外，根據檢測周期對其進行監測。

鞘液／沖洗液存放在地上的 CUBITAINER®中。

真空和壓力調節器旋鈕

20 In -Hg
真空調節器旋鈕

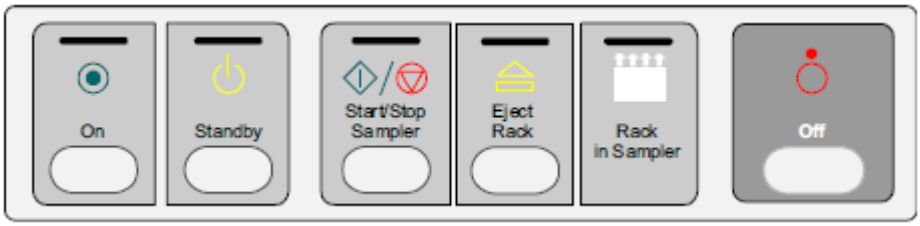
40 PSI
壓力調節器旋鈕



5 PSI
壓力調節器旋鈕

20 PSI
壓力調節器旋鈕

觸控板



觸控板位於分析儀的右下方，用於操作分析儀。

On（開）一爲分析儀裝置和電源提供電能。按下 **On（開）**後，可在 2.5 分鐘內處理通過手動開管和閉管進樣器的檢體，並且能夠在 4 分鐘內開始處理通過自動進樣器的檢體。

Standby（待機）一將分析儀設置爲低功耗狀態。要退出，請按 Standby（待機）。

Start/stop Sampler（啓動／停止進樣器）一從 Ready to Run（準備運行）模式下啓動自動進樣器操作，或停止自動進樣器。自動進樣器操作停止後，即允許將檢體下管收回。

Eject Rack（彈出樣品架）一將自動進樣器上的所有樣品架移到輸出隊列中。對所吸取的最後一份檢體的分析已完成。

Rack in Sampler（樣品架進入進樣器）一當檢體架位於自動進樣器中時（包括位於輸入隊列中時）亮起。

Off（關）一關閉分析儀中所有裝置和電器的電源，觸控板除外。

觸摸屏

觸摸屏顯示器允許您無需使用鍵盤就能直接在顯示器上執行日常操作。

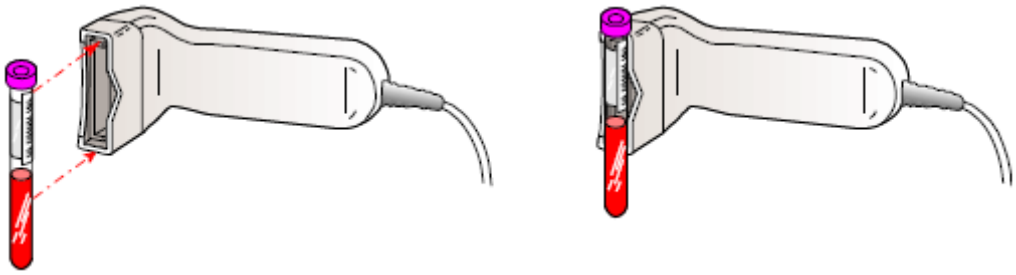
您可以在觸摸屏顯示器上執行以下操作：

- 用手指（戴／不戴手套均可）選擇所有窗口控件，包括功能按鈕和聯機幫助中的操作。
- 用手指按住窗口標題欄以移動窗口，將窗口拖到新位置。

注意：如果手指或手套沾水，觸摸屏可能不會正確響應。

使用醮取 5%漂白液的無塵紙巾擦拭觸摸屏顯示器。保證螢幕和您的雙手完全乾燥。

手動條碼閱讀器

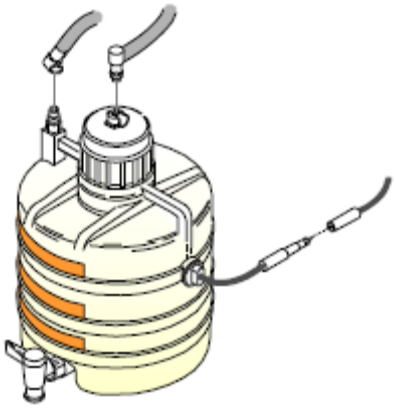


手動條碼閱讀器用於輸入檢體管標籤、試劑容器、質控品以及校正液上的訊息。正確讀取每個標籤後，閱讀器上的 LED 即會閃爍。

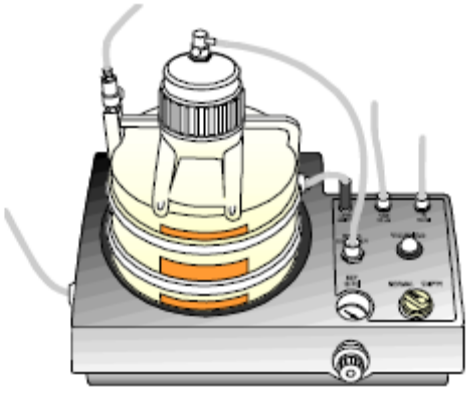
廢液處理系統

分析儀中的所有廢液都存儲在 11 升的廢液容器中。此容器可以是只能手動排空的獨立容器，也可以集成至自動廢液處理系統中。任一容器中的液體水平面達到最高水平面時（約 8 升），個人計算機顯示器上的狀態欄中會顯示一條錯誤消息。在清空廢液容器之前，分析儀不會吸取任何其它檢體。

獨立廢液容器



自動廢液處理

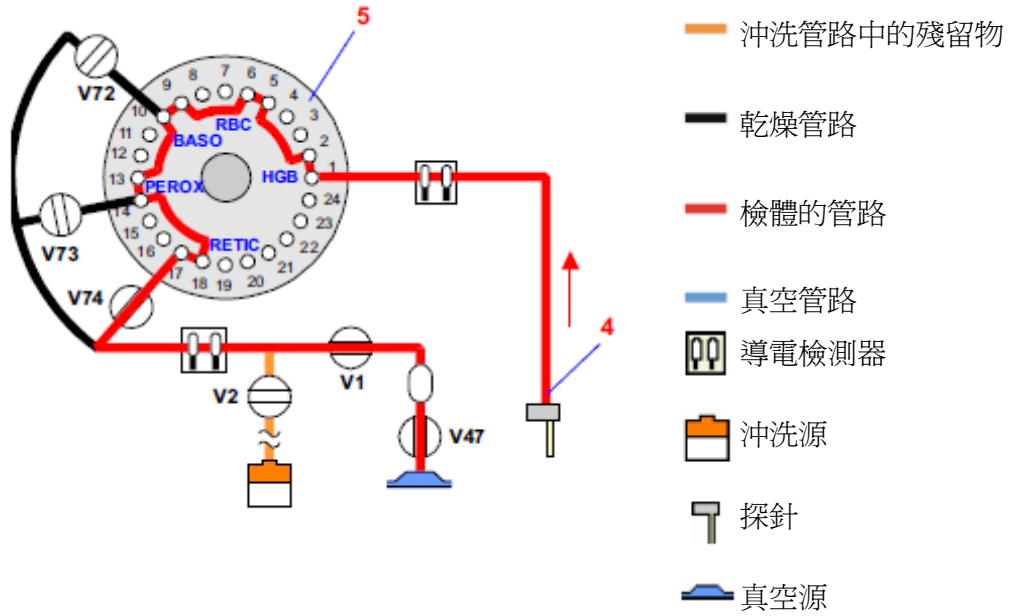


ADVIA 2120/2120i 血液分析儀工作原理

可以通過以下進樣器吸取血液檢體：

- 自動進樣器
- 手動閉管進樣器
- 手動開管進樣器

將吸取的檢體(4)吸入分血閥(5)。分血閥旋轉後，會將檢體”剪切”或分爲等分檢體以用於不同類型的測試。



試劑和檢體被輸送到對應的反應池中用於混合和吸取（PEROX 2 和 PEROX 3 試劑直接輸送到過氧化物酶反應池中。）

反應池中的細胞化學反應完成後，過氧化物酶、紅血球、嗜鹼性粒細胞和網狀紅血球反應池中的檢體和試劑混合物會被送到流通池中進行分析。

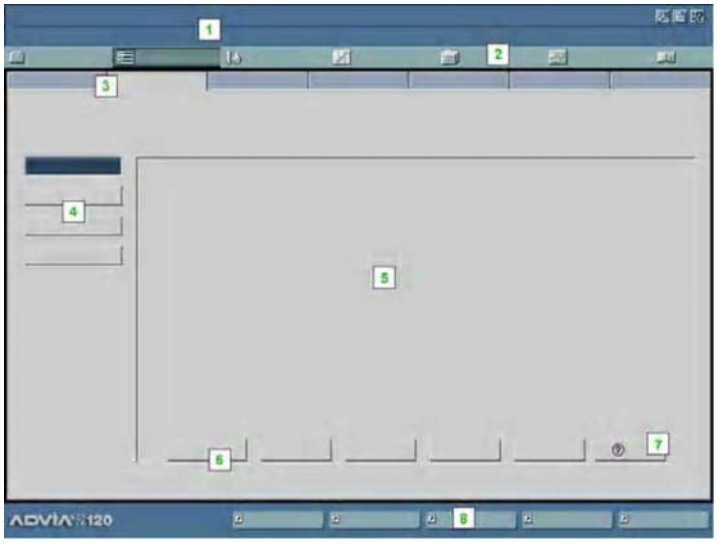
血紅素反應池(1)作爲光學比色杯，通過它讀取血紅素測量結果。

分析之後，檢體和試劑混合物排入廢液容器，並沖洗通道和反應池。

測試結果則發送到計算機以供檢查和編輯。

ADVIA 2120/2120i 軟體工作原理

ADVIA 2120/2120i 分析儀軟體是一個專用程序，在 Windows2000 操作系統下運行。可以使用滑鼠選擇並操作軟體系統。



1 狀態欄
2 菜單
3 跳格鍵
4 左側按鈕
5 主顯示區
6 底部按鈕
7 幫助按鈕
8 快捷鍵

狀態欄

存在兩個用於顯示系統消息的狀態欄。每欄都包含兩部分，分別用於顯示不同的訊息。



系統會將所有消息保存到消息日誌中。單擊消息圖標可以查看最近的 10 條消息。

第一個狀態欄

左側： 下一檢體 ID、檢體類型和請求的測試

右側： Service（服務）、Notepad（寫字板）、Help（幫助）、Printer（印表機）和 Autoslide 圖標



Service（服務）在預定維護過程過期時顯示



Notepad（寫字板）在 User Notepad（用戶寫字板）中出現新條目時顯示



Gray Autoslide（灰色 Autoslide）指示與 Autoslide 的通信尚未連接



Green Autoslide（綠色 Autoslide）指示 Autoslide 已就緒



Yellow Autoslide（黃色 Autoslide）指示 Autoslide 忙或正在運行程序。此外，也可能表示 Autoslide 已脫機或需要維護



Red Autoslide（紅色 Autoslide）指示發生嚴重 Autoslide 錯誤



Autoslide Service（Autoslide 服務）在預設定的 Autoslide 維護過程過期時顯示



要閱讀筒要幫助(What's This)，請單擊 **Help（幫助）**圖標，然後單擊需要獲得幫助的內容

第二個狀態欄

左側： 當前系統狀態，例如，**Ready to Run（準備運行）**

右側： 系統消息以及指示消息嚴重性的圖標



訊息一顯示一條用於提供訊息的消息。操作者無需回應。



警告一提醒您需要執行某些操作



故障一提醒您出現嚴重問題，需要立即進行干預，否則工作無法繼續。此類錯誤大多與造成系統自動停止的條件有關。

菜單

螢幕頂部的各個按鈕用於顯示相應的系統功能菜單。在按鈕上移動指針就會顯示相應菜單。單擊菜單項即可打開對應窗口，此時該按鈕顯示爲已被按下，且菜單中的其它功能顯示在狀態欄下方。

注意：System Setup（系統設置）(位於 Customize（自定義）菜單上）包含一個子菜單。要顯示該子菜單，將指針移動至菜單的 System Setup（系統設置）上。單擊子菜單上的一項可以打開對應窗口。

選項鍵

選項鍵與當前菜單上的項對應。可以單擊對應選項鍵以切換到其中的任何功能。選擇其它菜單中的選項時，選項鍵會更改爲對應菜單中的可用項。

左側按鈕

某些選項鍵包含多個窗口。單擊這些按鈕可在選項鍵中打開對應的窗口。

主顯示區

當您選擇一個菜單項或單擊一個選項鍵時，該區域中的選項下方會顯示對應窗口。通常，只需打開需要的窗口，即可在窗口之間進行切換。不過，某些窗口不會自動關閉，您需要在切換到新窗口之前單擊 Exit（退出）按鈕。

底部按鈕

這些按鈕可激活命令或處理窗口中的內容。

幫助按鈕

如果您需要有關逐步操作 ADVIA 2120/2120i 的詳細指導，請選擇 **Info（訊息）**。要查看簡要幫助(What's This)，請單擊狀態欄上的？圖標或同時按下 **Shift** 和 **F1** 鍵，然後單擊要查看其幫助的選項。

快捷鍵

通過單擊這些按鈕，無需使用菜單即可打開常用的軟體選項。您可以使用 System Setup（系統設置）中的 Shortcut Key Configuration（快捷鍵配置）窗口，選擇使用上述按鈕的選項鍵。

嚮導

本軟體提供多個嚮導，幫助您完成複雜過程。每個嚮導會在相應過程中顯示訊息並提示進行輸入，指導您完成相應過程。也可以選擇在執行這些過程時不使用嚮導的幫助。

列印螢幕

重要訊息：可以通過按下 Print Screen 鍵來列印任何螢幕。不過，如果在系統未連接印表機時按下 Print Screen 鍵，會導致系統故障。在嘗試列印螢幕之前，確識已連接印表機。

結果

ADVIA 2120/2120i 分析儀可以運行五種測試：CBC、CBC/DIFF、retic、CBC/retic 和 CBC/DIFF/retic 。

可以通過以下方法選擇這些測試：

- 將測試選擇設置爲默認值
- 通過 Manual Sample ID（手動檢體 ID）選項鍵確認測試類型
- 在條碼標籤中包含測試類型
- 在工作單中包含測試類型

在開始吸取之前都可以選擇測試。在開始吸取之後，系統會將當前所選的測試選擇賦予該檢體。

通過手動開管或閉管進樣器吸取檢體時，在確認不同測試請求之前，選擇的測試將保持不變。

在自動進樣器上運行檢體時，所選項總是會恢復爲默認設置。

系統將通過三種方式，就存在質疑的結果和潛在的系統狀況向您發出警報。

- 檢體／系統警示以代碼顯示在 Review/Edit（檢查／編輯）選項和 Run Screen（運行螢幕）上。這些代碼與帶有星號標記的特定測試參數相關聯。孤立警示實例通常與檢體相關。但如果多次出現，特別是對於連續檢體，往往說明分析儀存在問題。
- 形態學警示是以加號(+)顯示在 Review/Edit（檢查／編輯）選項和 Run Screen（運行螢幕）上。這些警示以及一到三個加號用於向操作者發出警報，指示需要其它實驗室進一步處理的可能細胞情況，例如準備血塗片以進行顯微鏡檢查。
- 系統消息顯示在 PC 顯示器上的狀態欄中。採用顏色編碼的圖標和這些消息一起指示了消息的嚴重程度。

規格

自動進樣器

檢體置放容量	150 支檢體
	15 個試管架，每架 10 支採血管
試管尺寸	10 mm 直徑
	50- 100 mm 高度
試管型態	部分允許試管類型：
	標準 Vacutainer®
	HEMOGRAD™
	中央穿孔之 Monovette®
	Venoject® II
條碼讀取器	讀取最多 14 碼
	自動標籤碼區分
	代碼欄
	使用或不使用驗證數位碼，在 5 個代碼間插入 2 個代碼
	代碼 39
	代碼 128 EAN 及 JAN (8 和 13)

數據管理

- 包含圖形在內的數據儲存容量(1,0000 份紀錄)
- 檢查和編輯功能

 使用者定義視窗

 使用者定義報告

 根據年齡和性別，使用者定義的正常、重新分析、有疑問，增量重驗的基準
- 雙向主機查詢通信計畫
- 品質管制

 3D 條狀圖

 Levey-Jennings 品管圖

 SDU 圖

 表格格式
- 遠端品質管制

- ILQC 程序
- 患者移動平均值
- 用戶指南
 上下文相關幫助
 操作者指南
 過程嚮導
 問題解決診斷
 遠端診斷

參數

全血細胞結果：

WBC、RBC、HGB、HCT、MCV、MCH、MCHC、CHCM、RDW、HDW、CH、CHDW、PLT

分類結果（絕對值和百分比）：

NEUT、LYMPH、MONO、EOS、BASO、LUC（大的未染色細胞）

血小板結果：

PLT、MPV、PDW、PCT

網狀紅血球結果：

% RETIC、＃RETIC、MCVr、CHCMr、CHr

形態學結果（用戶可定義）：

WBC：核左移、異形淋巴細胞、原始細胞*、未成熟粒細胞、髓過氧化物酶缺陷症

RBC：ANISO、MICRO、MACRO、HC VAR、HYPO、HYPER、紅血球碎片、影紅血球、NRBC、血小板凝集、大血小板

***原始細胞(Blasts)一限制**

需要由資深形態學技術人員進行塗片複檢，以確保檢測出明顯的異常血細胞。每間實驗室負責制定自己的複檢程序，以便根據血細胞自動計數結果和臨床訊息，來確定哪些檢體需要塗片檢查和／或手工分類計數，系統利用複雜算法來提供形態學和定量警示，幫助識別明顯異常的檢體。實驗室規程可在內部將這些警示用於塗片檢查和手動分類。只要發現形態學或定量警示，實驗室就應當負責對結果進行驗證。

性能規格

分析範圍（線性）

WBC	0.02 – 400 x $10^3/\mu L$
RBC	0.0 - 7.0 x $10^6/\mu L$
Plt	5.0 - 3500 x $10^3/\mu L$
Hgb	0 - 22.5 g/dL
Retic	0.2 - 24.5%

批內精密度

	均值	SD	CV
WBC	7.5	0.2	2.7
RBC	5.0	0.06	1.2
Hgb	15.0	0.14	0.93
MCV	90	0.7	0.78
Plt	300	8.8	2.93
Retic%	2.0	0.25	12.5

攜帶污染

＜或＝1 %（所有參數）

個人計算機技術規格（最低要求）

處理器	英特爾賽揚 2.2 GHz，帶有 512K 緩存／400MHz 前段總線處理器超線程已禁用
硬碟	40GB (7,200 rpm) IDE 硬碟一并行 ATA DiamondMax Plus 8 40GB ATA/133 HDD
CD RW	48x CD-RW(讀寫)驅動器 NEC CD-R/RW 驅動器，型號爲 NR-9300A
移動存儲	3.5”的 1.44Mb 軟碟。一 Samsung SFD-321J/ADNR
網卡	集成式英特爾千兆 LOM 網卡（10/100/1000) 3COM 3C900B-TPC Combo 卡，帶有 BNC 接口。
顯示卡	英特爾 Extreme 集成顯示卡 2
調制解調器	型號：Broadcom BCM94212/I V.92 56K PCI Modem 型號：BCM94212/I

內存	256MB DDR SDRAM (PC333 Non-ECC）內存(2x128MB)
聲卡系統	集成 Sound Blaster 兼容聲卡(AC97 Audio)
外接端口	1 個并行端口 1 個串行端口 8 個 USB 端口
揚聲器	內置戴爾商用揚聲器
操作系統	Microsoft Windows 2000 Professional (Service Pack 3)
文件系統	NTFS
可擴展性	2 個 PC（用於調制解調器和乙太網卡）
B10S 要求	必須可進行配置以符合下列限制。
B10S 限制	電源管理： 暫停模式 S3 AC 電源 關機 低電量模式 禁用 遠程喚醒 關機
機箱	小型台式機
外置磁碟驅動器	1 個 3.5”軟盤驅動器 1 個 5.25”軟盤驅動器
內置硬碟驅動器	1 (108 x 390 x 431mm)
電源	210W - 型號：HP - U2106F3 Rev. H01

物理規格

電源要求	可選單相電壓：100 VAC (6 AMPS) – 240 VAC (3 AMPS) 頻率：50/60Hz
溫度要求	運行時：18℃至 35℃ 存儲時：-45℃至 70℃
相對濕度	運行時：15％ - 80%（無凝結）
散熱量	低於 3000 BTU（低於 880W)
噪音級別	65 分貝
安裝類別	II
污染度	2
廢液處理	不含疊氮化物的試劑排入廢液容器液位傳感器。 每個 CBC/diff/retic 周期的廢液（包括沖洗液）：12 mL

ADVIA 2120/2120i 血液分析儀僅用於室內。

建議不要在緯度 2000 米（6000 英尺）以上的地點操作該儀器。

帶有自動進樣器的分析模組（包括試劑)			不帶自動進樣器的分析模組（包括試劑）		
重量	191.9kg	422.5lbs	**重量**	161.9kg	357.5lbs
高度	85cm	33.4in	**高度**	85cm	33.4in
寬度	141cm	55.5in	**寬度**	81cm	31.9in
深度	68cm	26.8in	**深度**	68cm	26.8in

檢體模式容量

自動閉管	175µL
手動閉管	175µL
手動開管	175µL

測試選擇／處理速度

CBC	120 份檢體／小時
CBC/diff	120 份檢體／小時
CBC/diff/retic	74 份檢體／小時
CBC/retic	74 份檢體／小時
RetiC	74 份檢體／小時

打開／關閉系統

概述 **2**

打開系統 **2**

關閉系統 **4**

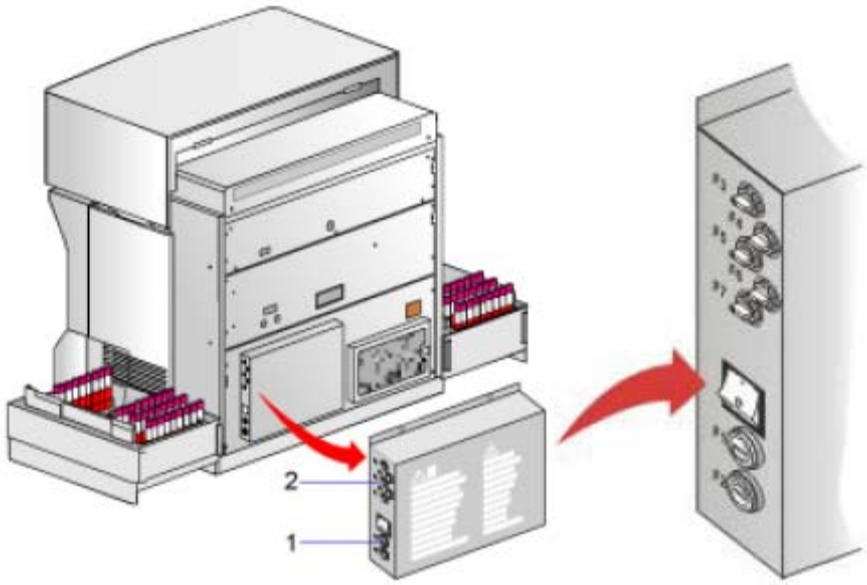
關閉系統：緊急情況 4
關閉系統：常規情況 4
退出 ADVIA 2120/2120i 軟體 4

概述

ADVIA 2120/2120i 血液分析儀包括兩個主要組件：計算機和分析儀。雖然分析儀帶有主電源開關，但還是必須單獨打開和關閉每個組件。

打開系統

1. 檢查主電源開關是否設置爲 On（開）。



如果主開關處效在 Off（關）位置，將其切換爲 On（開）。

2. 打開計算機。
 a. 將計算機電源開關設置爲 On（開）。
 b. 當計算機顯示 Begin Logon（開始登錄）消息時，同時按下 **Ctrl**、**Alt** 和 **Delete** 鍵登錄到 Windows。
 c. 在 Logon Information（登錄訊息）框中輸入操作者姓名和密碼。選擇 **OK（確定）**。
 d. 使用操作者姓名和密碼登錄到 Windows 後，計算機會自動啓動 ADVIA 2120/2120i 軟體。
 注意
 如果使用主管姓名和密碼登錄，系統會打開 ADVIA 2120/2120i Shell。

3. 打開分析儀。

重要訊息

要在關閉後再次打開分析儀，請務必保證中間至少間隔 60 秒以上。

a. 在分析儀觸控板上選擇 **On（開）**。

b. 計算機完成軟體加載後，會顯示 Log On/Off（登錄／註銷）選項。狀態欄上會顯示一條消息，指示系統正在準備。系統準備完成後，登錄到系統。

在系統準備期間，分析儀會：

- 執行內部診斷檢查
- 準備好清洗功能
- 對試劑管路進行灌注
- 開始 Startup（啓動）進程

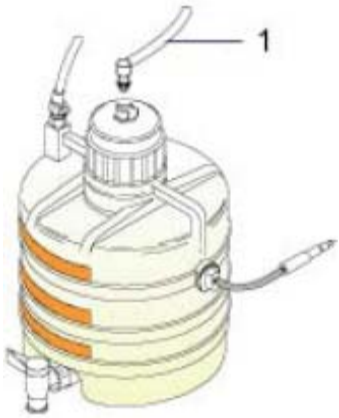
注意

如果任一內部診斷檢查失敗，系統狀態欄中將顯示一條錯誤消息。關閉系統，等待 60 秒，然後重新啟動。如果錯誤再次出現，請致電您的服務代表。

c. 系統會自動打開 Startup（啓動）選項。檢查 Startup（啓動）進程的狀態。

重要訊息

如果太快地關閉又重新打開分析儀，壓縮機可能無法啓動，導致系統初始化失敗。這是由於廢液容器仍然處於真空狀態導致的。操作者必須手動給廢液容器通氣。



要手動給任一廢液容器（手動廢液容器或自動廢液容器）通氣，請斷開其真空管(1)，等真空狀態解除後再重新接上。

關閉系統

重要訊息
爲確保系統性能良好，請每周至少將計算機關閉一次。

在關閉 ADVIA 2120/2120i 血液分析儀時，必須按照正確程序操作。否則，可能會導致數據庫損壞。

關閉系統：緊急情況

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 如果緊急狀況允許，在 Log On/Off（登錄／註銷）選項上選擇 **Shut Down ADVIA（關閉 ADVIA）**。
3. 將主電源開關設置爲 Off（關）。

注意
在緊急情況下關閉分析儀時，一些管路不能正常排空。因此，在重啟系統時，應在運行檢體前，使用 utilities（工具）菜單中的 Hydraulic Functions 清洗功能）選項執行 System Wash（系統清洗）。

關閉系統：常規情況

1. 在 Routine operations（日常操作）菜單中，選擇 **Log On/Off（登錄／註銷）**。
2. 選擇 **Shut Down ADVIA（關閉 ADVIA）**。
 等待 1 至 2 分鐘讓軟體關閉。
3. 將計算機的電源開關設置爲 Off（關）。

退出 ADVIA 2120/2120i 軟體

要在不關閉計算機電源的情況下退出 ADVIA 2120/2120i 軟體，請執行以下步驟：

1. 在 Operations（操作）菜單中，選擇 **Log On/Off（登錄／註銷）**。
2. 選擇 **Shut Down ADVIA（關閉 ADVIA）**。
 等待 1 至 2 分鐘讓軟體關閉。
3. 要重新啓動軟體，繼續執行”打開計算機”的第 2 步。

日常程序

開始每個批次 2

清空廢液容器 2
清空溢流瓶 4
檢查試劑 4
獲取本底計數 4

處理檢體 5

創建工作指令 5
列出等待的工作指令 6
運行檢體 6
查看樣品運行 8
對結果進行驗證 9

結束每個批次 10

清洗系統 10
執行 END OF DAY PROCEDURE（工作日結束流程） 10
註銷 12

開始每個批次

清空廢液容器

生物危害警告

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。應佩戴面部防護裝置、戴手套並穿防護服。

操作者應按照美國臨床實驗室標準化委員會（前 NCCLS）在《*Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition* 2005》，即 CLSI M29-A3 號文件中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

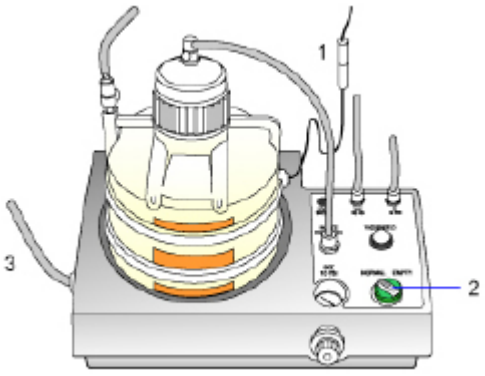
警示：所在地的法律和法規會通過管制有毒害廢棄物的處理來保護環境並鼓勵資源保護。由於分析儀產生的某些廢液屬於有毒害廢棄物，您必須熟悉所在地區適用的有毒害廢棄物處理法律與法規。

分析儀的所有廢液都存儲在 11 升的廢液容器中。當容器中的液體水平面達到最高水平面時（約 8 升），顯示器上的狀態列中會顯示一條錯誤消息，並會發出警示聲。在清空廢液容器之前，系統不會吸取任何其它檢體。

手動清除廢液

警示：斷開廢液容器前要確保所有周期都已完成。如果正在進行任何系統周期（包括系統啓動周期），廢液容器必須與系統連接。如果未連接廢液容器，液體會倒流到 UFC 中並造成系統損壞。

1. 確保分析儀未在進行採樣。
2. 如果顯示一條消息，要求進行沖洗或清洗，請選擇 **Cancel（取消）**。
3. 斷開廢液管(1)和真空管(2)：按住快速斷開接實上的按鈕(3)的同時向上拔開管子。
4. 按住液位開關傳感器接頭(4)的按鈕，將其斷開。
5. 用空容器更換整個容器，並將廢液管、真空管和液位傳感器連接到新容器。



警示：不要打開廢液容器的蓋子！如果蓋子鬆動或未正確更換，則無法達到足以操作的真空度。

6. 打開龍頭(5)，將廢液排入能承受每分鐘 5 升流量的排水管中，將整個容器清空。全部排放時間大約爲 2.5 分鐘。

7. 當廢液容器清空後，關閉龍頭，將容器存儲好備用。

重要訊息：確保關牢龍頭，否則無法達到足以操作的真空度。

自動清除廢液

警示：斷開廢液容器前要確保所有周期都已完成。如果正在進行任何系統周期（包括系統啟動周期），廢液容器必須與系統連接。如果未連接廢液容器，液體會倒流到 UFC 中並損壞系統。

重要訊息：力清空自動清除廢液系統，必須打開分析儀，而且不得效於 Standby（待機）模式。

1. 確保分析儀未進行採樣。

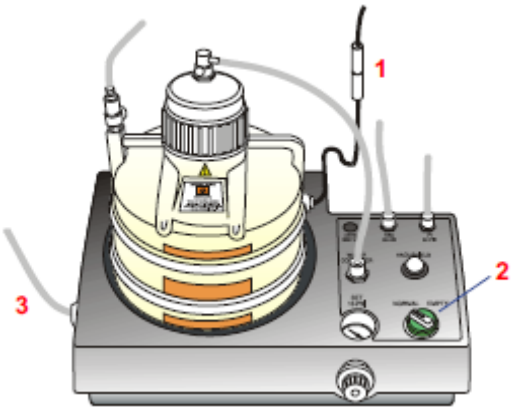
2. 如果顯示一條消息，要求進行沖洗或清洗，請選擇 Cancel（取消）。

3. 按住液位傳感器開關連接器(1)的按鈕，將其斷開。

警示：為防止在自動清除廢液系統排放時吸取檢體，請斷開液面開關傳感器。在廢液清除過程中吸取檢體會損壞分析儀。

4. 在廢液清除裝置托盤上，將模式選擇器旋鈕(2)從 **NORMAL（常規）**旋轉到 **EMPTY（清空）**。

5. 開始清空容器中的廢液。完全清空容器需要 2 至 5 分鐘。在排放管(3)中能看到氣泡時，說明容器已清空。



6. 容器清空後，重新連接液位傳感器開關(1)，並將模式選擇器旋鈕(2)轉回 **NORMAL（常規）**設置。

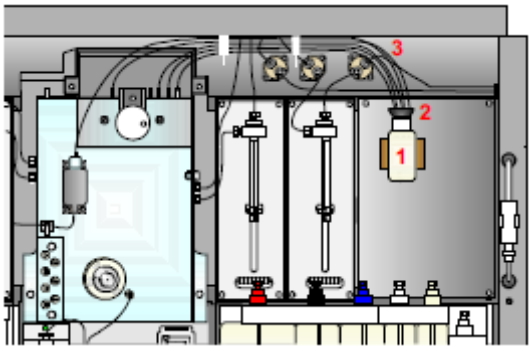
清空溢流瓶

重要訊息：如果液體持續在溢流瓶中積聚，請致電您當地的服務提供商或經銷商。

生物危害警告

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防拍裝置、戴手套並穿防護服。操作者應按照美國臨床實驗室標準化委員會（前 NCCLS）在《Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline – Third Edition 2005》，即 CLSI M29-A3 號文件中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

1. 目測檢查位於 RBC 檢體和鞘液泵右側的小溢流瓶(1)中的液體水平面。如果其中有液體，將其清空。
2. 將溢流瓶(1)從夾子中拔出，然後取下瓶蓋(2)。可以讓瓶蓋連著的線(3)鬆散地垂下。



3. 根據相應的實驗室規定和環保法規清空瓶中內容物。
4. 更換瓶蓋，然後將瓶子放回原位。
5. 確保採血管未被擠壓且未滑脫瓶蓋。採血管的末端距瓶底至少應有 1.5 英寸。必要時進行調整。

檢查試劑

1. 使用 Startup（啓動）選項或 Reagent Log（試劑日誌）選項檢查除 ADVIA 2120/2120i DEFOAMER 外所有試劑的供應。
2. 目測檢查 ADVIA 2120/2120i DEFOAMER 的供應。
3. 如果需要更換試劑，使用 Reagent Log（試劑日誌）選項。

獲取本底計數

運行本底計數周期以獲取 BASO WBC 本底計數、血小板本底計數以及 HGB 吸光度檢查。

1. 在 Operations（操作）菜單上，選擇 **Startup（啓動）**
2. 選擇 **Refresh（刷新）**。
3. 本底結果採用顏色編碼。
 - 綠色　在範圍內
 - 紅色　超出範圍

如果任一結果超出範圍，在 Startup（啓動）選項上選擇 **Refresh（刷新）**來運行另一個本底計數周期。如果結果仍然不可接受，請清洗系統。

處理檢體

創建工作指令

可以通過 Order Entry（工作指令輸入）窗口，在分析儀上創建並管理工作指令。還可以在主計算機上創建工作指令。

使用 SID#創建工作指令

1. 在 Access（訪問）菜單中，選擇 **SID#**（檢體 ID 號）。
2. 在 SID#框中，輸入檢體 ID，然後按 **Enter** 鍵或選擇 **OK（確定）**。
3. 可選：輸入檢體和患者訊息。使用 Tab 鍵在字段間移動。
4. 選擇測試。
5. 選擇 **OK（確定）**來確認輸入。
6. 出現下一個工作指令的 Access（訪問）討話框。

使用 Patient#（患者號）創建工作指令

1. 在 Access（訪問）菜單中選擇 **Pat#**。
2. 在 Pat#框中，輸入患者編號，然後按 **Enter** 鍵或選擇 **OK（確定）**。如果該患者有多個工作指令，會將其全部列出。
3. 選擇 **Create（創建）**，爲該患者建立一個新工作指令。
4. 輸入檢體和患者訊息。
5. 使用 Tab 鍵在字段間移動。
 您必須輸入一個檢體 ID 號。
6. 選擇測試。
7. 選擇 **OK（確定）**來確認輸入。
 顯示下一個工作指令的 Access（訪問）對話框。

使用患者姓名創建工作指令

1. 在 Access（訪問）菜單中選擇 **Name（姓名）**。
2. 在 Name（姓名）框中，輸入患者姓名，然後按 **Enter** 鍵或選擇 **OK（確定）**。
 （要查看患者列表，鍵入？，然後按 Tab 鍵即可。）
3. 如果輸入的患者名已存在，您可以：
 選擇 **Create（創建）**，爲該患者建立一個新工作指令。選擇 **New Patient（新患者）**，創建一個使用該名字的新患者文件。

4. 輸入檢體和患者訊息。
5. 使用 Tab 鍵在字段間移動。
 您必須輸入一個檢體 ID 號。
6. 選擇測試。
7. 選擇 **OK（確定）**來確認輸入。
 顯示下一個工作指令的 Access（訪問）對話框。

列出等待的工作指令

1. 在 Customize（自定義）菜單上，選擇 **Tools View（工具視圖）**。
2. 出現工具列表時，雙擊 **File Management（文件管理）**。
3. 選擇 **Pending（掛起）**複選框。
4. 可選：使用 TO（結束日期）和 From（開始日期）日期框將列表限定在某特定期間內創建的工作指令。
5. 可選：從 Format（格式）列表中選擇報告格式。通常選擇 DEFAULT（預設）即可。
6. 選擇 **Display（顯示）**查看列表，或選擇 **Print（列印）**將其列印出來。

運行檢體

質控品建議

- 按照實驗室協議運行質控品。
- 在每個批次開始前運行多水平的質控品。
- Siemens 建議使用 ADVIA TESTpoint 血液質控品（低、正常、高）和 ADVIA TESTpoint 網狀紅血球質控品（低、高）。
- 單獨運行質控品或在開始處理患者時運行。
- 您也可以定期運行保留的患者檢體來監控性能趨勢。
- 在報告患者結果前評估所有質控品結果。
- 如果質控品結果未能滿足實驗室制定的接受標準，必須評估不可接受的運行中獲取的所有患者測試結果，來確定患者結果是否受到了不利影響。
- 在報告患者結果前執行相對的糾正操作，如重新校正並重新分析患者檢體等，並將其存檔。

從自動進樣器運行檢體：

1. 按下列順序加載檢體：
 - 全血標本（標本標籤）
 - 質控品（質控品標籤）
 - 患者檢體（檢體 ID 標籤）

 a. 將採血管插入試管架，條碼位於試管架條碼之上且清晰可見，以顯示試管架號以及檢體位置。不要傾斜採血管。

 b. 將試管架放入輸入隊列，標籤面向分析儀前面。
2. 如果 Standby（待機）指示燈亮起，按下 Standby（待機）。
3. 在觸控板上選擇 **Start/stop Sampler（啓動／停止進樣器）**。
 Start and Rack in sampler（啓動且試管進入進樣器）指示燈亮起。
4. 評估質控品結果，或在有可用患者結果的時候對其進行驗證。

要以手動閉管進樣器運行檢體：

1. 如果 Standby（待機）指示燈亮起，選擇 **Standby（待機）**。
2. 按下列順序運行檢體：
 - 全血標本（標本標籤）
 - 質控品（質控品標籤）
 - 患者檢體（檢體 ID 標籤）
3. 掃描採血管標籤，或在 Manual Sample ID（手動檢體 ID）選項中輸入檢體訊息。

 重要訊息：在使用手動開管進樣器或手動閉管進樣器吸取檢體前，確保狀態列中顯示正確的檢體 ID。當系統搜索匹配的工作單時，等待狀態列的顯示結果。

 確保狀態列顯示正確的檢體選擇。如果使用不匹配的選擇運行質控品（例如：使用 Retic 選擇運行 CBC/Diff 質控品），結果不會顯示在 Review/Edit（檢查／編輯）選項上，而且在某些情況下，系統計算機會請求重新啓動。
4. 吸取檢體。

 a. 將裝有混合檢體的採血管插入並下推到手動閉管進樣器中。保持採血管與進樣器的筒壁平行。

 b. 自動吸取檢體，採樣燈閃爍。

 c. 採樣燈停止閃爍時，取出採血管。
5. 評估質控品結果，或在有可用患者結果的時候對其進行驗證。

要從手動開管進樣器運行檢體：

1. 如果 Standby（待機）指示燈亮起，選擇 Standby（待機）。
2. 按下列順序運行檢體：
 - 全血標本（標本標籤）
 - 質控品（質控品標籤）
 - 患者檢體（檢體 ID 標籤）
3. 掃描採血管標籤，或在 Manual Sample ID（手動檢體 ID）選項中輸入檢體訊息。



重要訊息：在使用手動開管進樣器或手動閉管進樣器吸取檢體前，確保狀態列中顯示正確的檢體 ID。當系統搜索匹配的工作單時，等待狀態列的顯示結果。

確保狀態列顯示正確的檢體選擇。如果使用不匹配的選擇運行質控品（例如：使用 Retic 選擇運行 CBC/Diff 質控品），結果不會顯示在 Review/Edit（檢查／編輯）選項上，在某些情況下，系統計算機會請求重新啓動。

4. 吸取檢體。
 a. 擺好採血管的位置，以便進樣器探針插入混合好的檢體中。
 b. 將進樣器探針插入足夠深度（約 0.25 英寸）即可，以確保吸取。
 c. 按下吸液板。在吸液期間，採樣燈一直閃爍。
 d. 採樣燈停止閃爍時，取出採血管。
5. 評估質控品結果，或在有可用患者結果的時候對其進行驗證。

查看樣品運行

1. 在 Data Manager（數據管理器）菜單中，選擇 **Sample Cont. Panel（檢體控制面板）**。
2. 使用數據庫狀態區來按照檢體狀態處理記錄。
3. 要獲得具有特定狀態的檢體列表，選擇狀態框，然後選擇 **File Mgt（文件管理）**。
4. 要驗證具有特定狀態的檢體的結果，選擇狀態框，然後選擇 **Rev/Edit（檢查／編輯）**。
5. 測試面板區提供逐個測試的質控品性能評估，以及按吸取時間排列的檢體列表。質控品顏色代碼如下所示：

 綠色　測試的質控品結果在目標值與±2 SD 之間。

 黃色　至少一個質控品結果在+2 SD 和+3 SD 之間或-2 SD 和-3 SD 之間。

 紅色　至少一個質控品結果低於-3 SD 或高於+3 SD。

討結果進行驗證

1. 在 Data Manager（數據管理器）菜單中，選擇 **Review/Edit（檢查／編輯）**。
2. 如果還沒有確定要檢查哪些檢體記錄，選擇驗證模式和訪問模式來確定。
3. 檢查所顯示的結果。滾動查看其他結果。
4. 您可以：

 - 如果所有結果都可接受，轉到第 5 步。
 - 編輯結果。

 a. 選擇測試的 **C. RES（當前結果）**框。

 b. 輸入新值或注釋代碼。

 選擇 **End（結束）**退出，或選擇 **Next（下一個）**編輯其他結果。可以選擇 **Individual（單個）**編輯一個結果；選擇 **Successive（連續）**訪問所有結果；或選擇 **Pending（掛起）**僅訪問缺失結果。

 - 將處理應用於單個結果。

 a. 右鍵單擊要接受處理的測試旁的 D 欄。

 b. 選擇所需處理。

 None（無），取消之前的所有處理。

 Rerun（重運行），使用相同檢體 ID，不加稀釋劑重複測試。

 D 框中會顯示字母“R”。

 Exchange（交換），交換 C.RES（當前結果）和 PREV.RUN（以前的運行）框中的訊息。D 框中會顯示字母“X”。

 Accept（接受），表明結果得到操作者批准。D 框中會顯示字母“A”。

 Delete（刪除），清除結果。D 中會顯示字母“D”。

 Dil.Sample（稀釋檢體），使用不同的檢體 ID，加特定稀釋劑重複測試。如果結果可用，選擇 **Dil.Cons（稀釋過檢體一整合）**來將結果輸入到原始檢體記錄中。

 對於質控品檢體來說，只能使用 Accept（接受）和 Delete（刪除）。

 處理在您驗證結果時生效。

 - 將處理應用於所有結果。

 a. 選擇 **Global Disposition（全面處理）**，或選擇 **Sample（檢體）**菜單，然後選擇 **Global Disposition（全面處理）**。

 b. 選擇所需處理。（請參見上文中的可用處理。）處理在您驗證結果時生效。

5. 選擇 OK（確定）來驗證檢體結果。

注意：確保在運行檢體前完成檢體驗證（步驟 1 至 5）。否則，檢體會使用默認選擇重運行。

結束每個批次

清洗系統

在每個批次或工作期間（最長 8 小時）結束時執行系統清洗操作步驟。在測試最大數量檢體的實驗室批次結束後，運行三個系統清洗周期；在其他批次後，只需運行一個清洗周期。另外，如果一個批次中的檢體數超過 400，則在第 400 份檢體之後執行一次系統清洗。

1. 在 Utilities（工具）菜單中，選擇 **Hydraulic Functions（清洗功能）**。
2. 選擇 **System Wash（系統清洗）**，爲 **Number of Cycles（周期數）**選擇 **1**，然後選擇 **Start（開始）**。

執行 End of Day Procedure（工作日結束流程）

要重新設置 SID，並停止 QC 及移動均值統計（**Tools View（工具視圖）)**：

1. 在 Customize（自定義）菜單上，選擇 **Tools View（工具視圖）**。
2. 當顯示工具列表時，雙擊 **End of Day（工作日結束）**。
3. 選擇 **Yes（是）**，確認您已完成了工作量。如果保存，這時就會顯示上一個工作日結束操作時所做的選擇。
4. 選擇 **SID RESET (SID 重新設置）**複選框來執行 SID RESET（SID 重新設置）。
5. 如果需要，選擇 **Q.C. Close out （Q.C.停止）**複選框，將日常 QC 文件移動到 Cumulative QC（累積 QC）文件。
 使用列表框選擇停止所有質控品或某個特定質控品。
6. 如果需要，選擇 **MOV.AVG Close out（移動均值停止）**複選框，從日期早於 Up to（最晚日期）框中日期的移動均值質控品統計中，獲取累積數據點。
7. 選擇 **OK（確定）**來確認並開始。

要備份和清除數據文件（工具修改）：

1. 在 Customize（自定義）菜單中，選擇 **System Setup（系統設置）**。然後選擇 **Tools Modify（工具修改）**。
2. 顯示工具列表時，雙擊 **End of Day（工作日結束）**。
3. 選擇 **SID RESET（SID 重新設置）**複選框來執行 SID RESET（SID 重新設置）。
4. 如果需要，選擇 Q.C. Close out（Q.C.停止）複選框，將日常 QC 文件移動到 Cumulative QC（累積 QC）文件。

使用列表框選擇停止所有質控品或某個特定質控品。

5. 如果需要，選擇 **MOV.AVG Close out（移動均值停止）**複選框，從日期早於 Up to（最晚日期）框中日期的移動均值質控品統計中，獲取累積數據點。
6. 如果需要，選擇所有要備份的文件的複選框。檢查 Q.C.文件備份的目的地。
7. 選擇 **Purge Database（清除數據庫）**複選框。
8. 注意 Total Samples（全部檢體）及 To be purged field（要清除字段）中的值。在 TO be purged field（要清除字段）中，輸入要從 All Complete（全部完成）文件中刪除的記錄數（如果存在）。
9. 選擇 **OK（確定）**以確認並開始。
10. 如果您在第 6 步中要求進行備份，會要求在磁盤驅動器中插入已格式化的磁盤。

 對備份磁盤的要求如下：

 - 程序：格式化一張或多張帶有 **PRG** 標籤的磁盤。
 - 目錄：格式化一張帶有 **DICT** 標籤的磁盤。
 - 累積品質管制：格式化一張磁盤，無需帶有標籤。
 - 數據庫：需要 4 張格式化過的磁盤來備份 2000 個 All Complete（全部完成）檢體記錄。數據庫磁盤無需標籤。系統將在備份過程中自動爲這些磁盤打上標籤。

 如需多張磁盤，在格式化過程中爲每張磁盤輸入的內部標籤必須相同。要通過外觀識別每張磁盤，只能使用紙質標籤標識。

 要格式化磁盤並爲其打上標籤，依次選擇 **Utilities（工具）菜單**、**Backup/Restore（備份／恢復）**和 **Format（格式化）**。

註銷

1. 在 **Operations（操作）菜單**中，選擇 **Log On/Off（登錄／註銷）**
2. 選擇 **Log Off（註銷）**。

維護分析儀

時間表 **2**

系統清洗 **3**

清洗定心環 **4**

清潔 UFC 中的分血閥和吸取通道 **7**

清潔分血閥 **7**

清潔分血閥：步驟 1 拆開分血閥的各個片 8
清潔分血閥：步驟 2 清潔分血閥的閥片 9
清潔分血閥：步驟 3 組裝分血閥 10
清潔分血閥：步驟 4 檢查分析儀性能 10

檢查並清潔注射器推筒 PN 067-506-01 和 PN 067-506-02 **10**

更換進樣器針 **13**

更換鞘液過濾器 **15**

更換 50 或 1000 µL 的注射器推筒 PN 067-506-01 和 067-506-02 **16**

清潔空氣循環過濾器 **19**

檢查 PEROX-CAP 通氣孔中是否存在殘留物質 **19**

清潔自動進樣器吸取裝置 **20**

時間表

爲保證分析儀的運行效率，必須根據下面列出的時間頻率執行特定操作步驟。

1,000 份檢體後或每天

- 清洗系統。

 在每個批次或工作期間（最長 8 小時）結束時執行系統清洗操作步驟。在測試最大數量檢體的實驗室批次結束後，運行三個系統清洗周期；在其他批次後，只需運行一個清洗周期。另外，如果一個批次中的檢體數超過 400，則在第 400 份檢體之後執行一次系統清洗。

2,000 份檢體後或每周，在執行重新校正之前

- 沖洗 RBC/baso/retic 流通池。
- 清潔 UFC 中的分血閥和吸取通道。
- 檢查定心環。必要時進行清潔。
- 關閉系統。
- 清潔分血閥。

16,000 份檢體後或每兩個月

- 檢查注射器和推筒，PN 067-B506-01 和 PN 067B506-02。必要時進行清潔。
- 更換 50-µL 注射器推筒 PN 067B506-01。
- 檢查 Perox-cap 通氣孔中是否存在殘留物質。必要時進行清潔。

每 6 個月

- 更換 1000-µL 注射器推筒 PN 067-B506-02。
- 清潔空氣循環過濾器。
- 更換自動進樣器針和／或手動進樣器針。

重要訊息

除上述計劃的過程以外，還必須定期檢查 UFC 通道、真空緩衝區和反應池。如果在任何管道或箱內發現殘留物或污垢，應清潔相應的管道或箱。

系統清洗

時間：6.5 分鐘

分析儀模式：準備運行

在每個批次或工作期間（最長 8 小時）結束時執行系統清洗操作步驟。在測試最大數量檢體的實驗室批次結束後，運行三個系統清洗周期；在其他批次後，只需運行一個清洗周期。另外，如果一個批次中的檢體數超過 400，則在第 400 份檢體之後執行一次系統清洗。

範例 1：實驗室工作量爲 1000 份檢體／天

批次 1	800 份檢體	在 400 份檢體後清洗 1 次系統
		在批次結束後共清洗 3 次系統
批次 2	100 份檢體	在批次結束後共清洗 1 次系統
批次 3	100 份檢體	在批次結束後共清洗 1 次系統

範例 2：實驗室工作量爲 300 份檢體／天

批次 1	175 份檢體	在批次結束後共清洗 3 次系統
批次 2	75 份檢體	在批次結束後共清洗 1 次系統
批次 3	50 份檢體	在批次結束後共清洗 1 次系統

範例 3：實驗室工作量爲 350 份檢體／天

批次 1	350 份檢體	在批次結束後共清洗 1 次系統

重要訊息

系統中有 2 個 EZ KLEEN 容器，每個 EZ KLEEN 容器（PN T01-3624-54)可供 18 個系統清洗周期可用，所以一共可運行 36 個周期。請相應地安排試劑。

要開始系統清洗

1. 在 Utilities（工具）菜單中，選擇 **Hydraulic Functions（清洗功能）**功能。
2. 選擇 **System Wash（系統清洗）**，爲 Number of Cycles（周期數）選擇 **1**，然後選擇 **Start（開始）**。

清洗定心環

如果存在殘留物，清洗定心環和基座。

檢查自動進樣器吸取裝置區是否存在殘留的鹽質。必要時進行清潔。



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，操作者應按照美國臨床實驗室標準化委員會(NCCLS) M29-A號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

生物危害警告

需要的物品

- 燒杯(2)
- 棉花棒
- 家用漂白水
- 紙巾
- 探針或細線
- 注射器
- 軟管，0.020-inch ID

時間：每個定心環 10 分鐘

分析儀模式：關機



警告

分析儀*必須關機*;否則針可能會造成人身傷害。

要清潔定心環



警告

為避免人身傷害和受到潛在的生物危害，必須在取下定心環之後立即使用紅色針蓋來蓋住針。在給針加蓋時注意不要讓針彎曲。

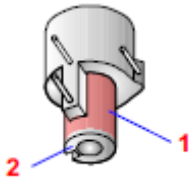
1. 關閉分析儀。
2. 從自動進樣器或手動閉管進樣器上取下定心環（請參見下文中的特定操作步驟）。
3. 將定心環放到裝有 25%家用漂白水溶液的燒杯中，浸泡 5 分鐘。
4. 使用棉花棒擦掉所有剩餘的殘留物，然後用水沖洗。

5. 使用探針或一段細線，清潔自動進樣器定心環上的 3 個接頭和中心孔，或清潔手動閉管進樣器定心環上的接頭和中心孔。

6. 將一段 0.030-inch ID 的管連接到注射器，然後用水沖洗自動進樣器定心環的每個接口，或沖洗手動閉管進樣器定心環的廢液口。

重要訊息

爲防止自動進樣器定心環鎖定，請在定心環的管狀部分(**1**)使用 Parker Super O-lube（或相近的潤滑劑）。



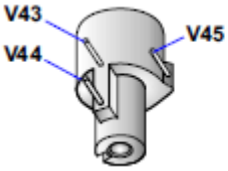
不要讓潤滑劑沾染到靠近針或針座(**2**)的部分。

注意

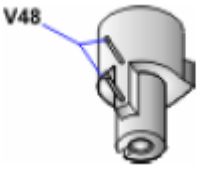
雙自動進樣器有兩個定心環，一個用於分析儀採樣，一個用於可選的 Autoslide 採樣。兩個定心環使用相同的清潔方法。

7. 將自動進樣器上的採樣管以外的所有採血管重新連接到定心環。

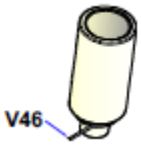
分析儀定心環



Autoslide 定心環



MCTS



8. 取下針蓋，小心替換針上的環。在自動進樣器定心環上，務必將彈簧式旋鈕轉回到其原始位置。

9. 在自動進樣器上，調整自動進樣器吸取裝置的位置。確保該裝置安裝到位，然後重新將檢體管連接到定心環底座。

警示

調整吸取裝置的位置後，用手擰緊翼形螺釘，注意不要使螺紋交錯。將螺釘擰得過緊會導致底板翹曲，使得進樣器不能正確對齊。翼形螺釘的螺紋交錯會損壞針。

10. 將採血管朝向自動進樣器定心環的方向，放入 ID 閱讀器一側的”鉤”中。

11. 將手動進樣器定心環卡入到位。

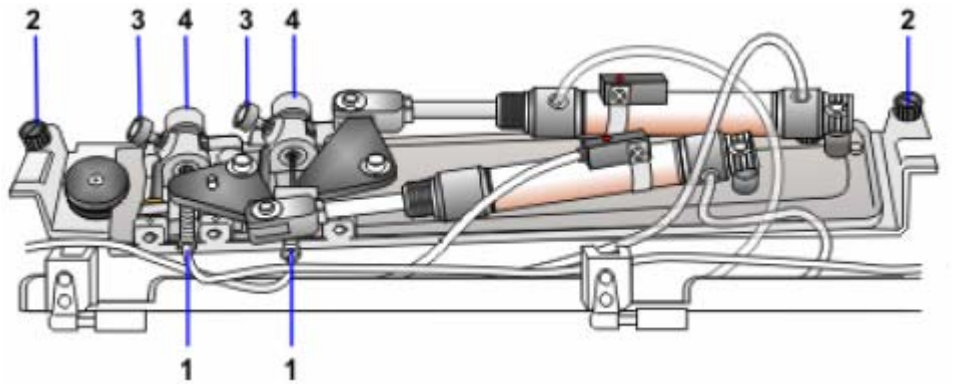
12. 蓋上分析儀的益。

13. 打開分析儀的電源。

14. 檢查鹽水本底計數並測試全血標本，以檢查系統性能。

要從自動進樣器上取下定心環

1. 向下轉動前蓋板。



2. 從針座底部取下檢體管(1)。

警示

必須先取下檢體管，然後才能向前轉動吸取裝置。如果將管保持在原位不動，則轉動該裝置時會導致管破裂。

3. 鬆開翼形螺釘(2)，向前轉動自動進樣器吸取裝置。
4. 向上拉動彈簧式旋鈕(3)並將其轉動 1/4 圈，然後向上並向外拉出定心環(4)以取下它。

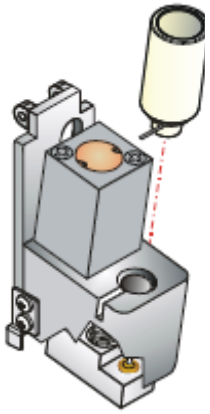
注意

如果定心環鎖定得較緊，可以在定心環上噴上少許溫熱的去離子水以使其鬆動。

5. 將紅色針蓋蓋在針上。
6. 從定心環上拔下 3 根採血管。

要從手動閉管進樣器上取下定心環

1. 向下轉動前蓋板。
2. 向上拉動定心環。
3. 從接頭拔下管。
4. 將紅色針蓋蓋在針上。



清潔 UFC 中的分血閥和吸取通道

時間：15 分鐘

需要的物品：燒杯、家用漂白水和水

分析儀模式：做好運行準備

要清潔 UFC 中的分血閥和吸取通道

1. 在 Utilities（工具）菜單中，選擇 **Exerciser（試驗器）**選項。
2. 選擇左側的 **Syringe Pumps（注射器泵）**。如果 Selector valve（換向閥）下方圖像上的箭頭沒有指向 Open（打開），請選擇該圖像，直到箭頭指向 Open（打開）。
3. 選擇左側的 **Valves（閥）**。
4. 選擇要關閉的 **V72** 閥。
5. 選擇要打開的 **V1**、**V47** 和 **V74** 閥。
6. 將一燒杯家用漂白水放在開管進樣器探針下，直到吸取 5 mL 漂白水。
7. 使用 5 mL 水，重複第 **4** 步。
8. 關閉閥 **V74** 並選擇打開 **V72**。確保 **V73** 已關閉。
9. 重複第 **4** 步和第 **5** 步。
10. 選擇要關閉 **V74** 和 **V72**，然後選擇打開 **V73**。
11. 重複第 **4** 步和第 **5** 步。
12. 關閉閥 **V1**、**V47** 和 **V73**。選擇 Analyzer Status（分析儀狀態）選項，退出 Exerciser（試驗器）。



關閉閥



打開閥

清潔分血閥

需要的物品：

- 燒杯
- 家用漂白水
- 紙巾
- 噴瓶
- 超音波清洗設備（如果有）

時間：清洗－15 分鐘

檢查－15 分鐘

分析儀模式：待機

在重新校正系統以前清潔分血閥的各個面。

對於大工作量實驗室或者處理透析檢體或陳年檢體等極黏稠血液的實驗室，可能需要更爲頻繁地清潔分血閥。

生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

操作者應按照建議進行操作對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《*Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)*》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

要清潔分血閥

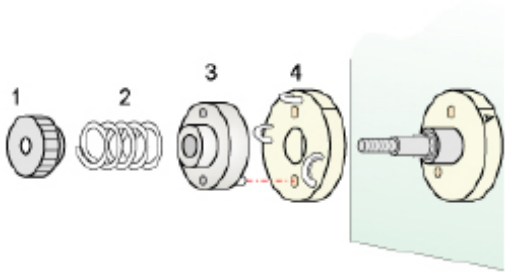
1. 拆卸分血閥
2. 清潔分血閥
3. 重新組裝分血閥
4. 檢查分析儀

清潔分血閥：步驟 1
拆開分血閥的各個片

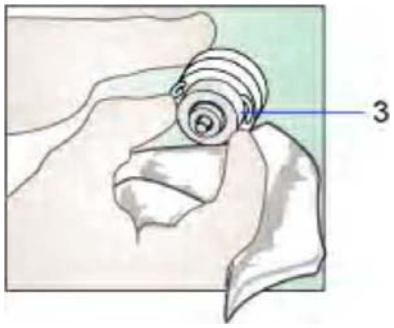
重要訊息

將紙巾墊在分血閥下，防止液體滴落到分析儀中。

1. 朝逆時針方向轉動以拆下螺帽 (1) ↺，然後取下壓縮彈簧(2)。

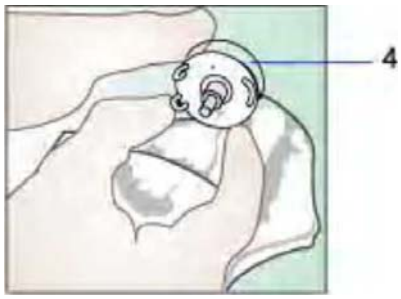


2. 要取下轉子(3)，用一只手按住分血閥，用另一只手旋轉轉子，直到可將其從軸上向前拉下。



3. 要取下前分血片(4)，輕輕轉動前片直到其鬆動，然後向前拉並將其取下。

 後分血片爲靜止片。



警示

為防止損壞將分血閥與 UFC 的有機玻璃層隔開的墊圈，取下前分血片時不要太用力。

不要使用螺絲刀等鋒利工具拆下分血片。如果難以拆下轉子或前分血片，按住分血閥下的紙巾，向閥上噴一些溫水。如果已取下轉子，向分血片前面的兩個孔中噴一些溫水。等待溫水將閥浸泡幾分鐘，然後取下轉子和／或分血片。

如果仍然難以卸下分血片，請使用備件包中附帶的分血片拆除工具(PN 067-1083-01)。輕輕將該工具的鋒利邊插入兩個面之間，然後拆下前分血片。

清潔分血閥：步驟 2

清潔分血閥的閥片

1. 將前分血片放在一燒杯家用漂白水中。如果實驗室配備了超音波清洗設備，請遵循廠商提供的說明進行操作。否則，在燒杯中將分血片浸泡 10 分鐘，然後用水徹底沖洗。
2. 要沖洗後分血片，請使用裝有水的洗瓶。使用紙巾擦去水滴。

警示

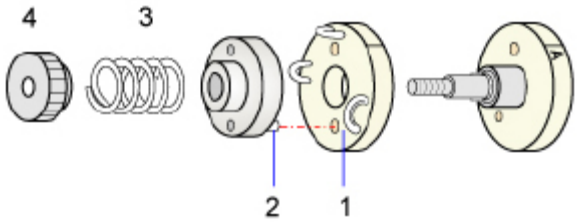
不要使用紙巾擦拭分血片。否則分血片上可能會留下纖維。

清潔分血周：步驟 3
組裝分血閥

警示

不必等到分血片乾透即可組裝分血閥。切勿使用紙巾、紗布或棉花棒擦拭分血片。這些物品可能會在表面上留下纖維，並可能造成精密凹槽阻塞。

1. 抖落多餘的水，然後將前片的黑線與後片上的黑線和 A 對齊，將前片安裝到軸上。較小的環應當放在 9 到 11 點鐘位置，而大環應放在 5 點鐘位置。
2. 將軸插銷(2)插入前片右側的孔(1)中來安裝轉子。
3. 更換彈簧(3)和螺帽(4)。用手擰緊螺帽。



清潔分血閥：步驟 4
檢查分析儀性能

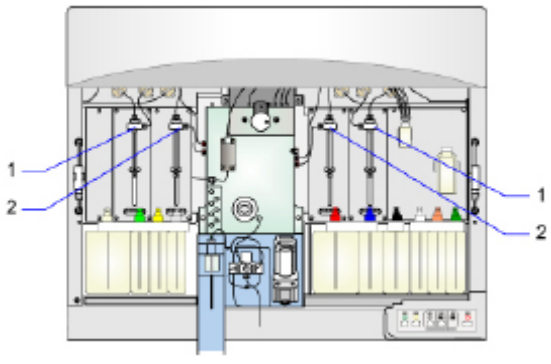
通過以下方法檢查分析儀的性能：

- 檢查鹽水本底
- 測試全血標本
- 測試質控品
 如果質控品未能恢復，請校正受影響的通道。

檢查並清潔注射器推筒 PN 067-506-01 和 PN 067-506-02

在檢查鹽水標本期間檢查推筒頂端。

推筒頂端（鞘液 1〔1000 µL 注射器）和檢體 2〔50 µL 注射器〕）與注射器管之間的正常磨損會導致一些小顆粒脫離。這些小顆粒看上去就是推筒頂端的灰色凝膠。如果此凝膠進入液壓系統，會造成分析儀中出現阻塞問題。必要時進行清洗。



需要的物品：

- 無塵紙巾
- 小六角扳手

時間：每個推筒 15 分鐘

分析儀模式：關機

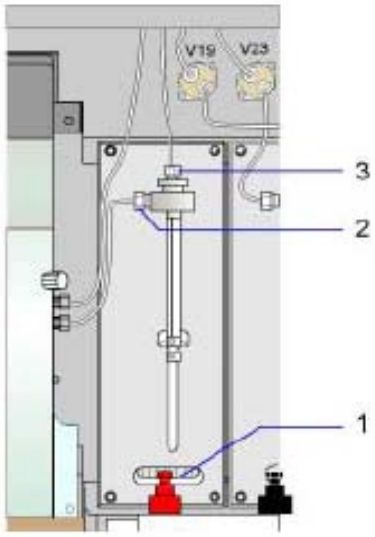
生物危害

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操作者應按照建議進行操作對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《*Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)*》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

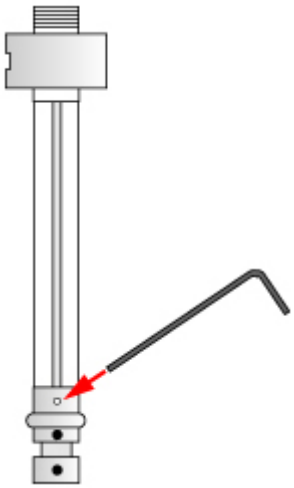
要清潔更換注射器和推筒

1. 取下注射器。
 a. 朝逆時針方向轉動撥輪(1) ↺，直到推筒降低大約 1/2 英寸(1.27 cm)。
 b. 將輸入(2)和輸出(3)裝置與注射器實斷開連接。
 c. 卸下注射器頂端起保據作用的螺母和墊圈。朝底座的底部方向向下滑動注射器管以露出安裝孔，然後將其取下。



警示

在清潔 50 µL 的注射器時，切勿將推筒從注射器中的小塑料套管中拉出。這樣做會損壞注射器推筒的頂端。使用小六角扳手將套管從注射器中彈出，然後從注射器上取下推筒，但兩個套管仍然位於推筒杆上。不要從 50 µL 的推筒上取下塑料套管。



2. 從注射器上取下髒推筒。不要取下推筒上的白套管，也不要從底部的不鏽鋼管墊圈上取下推筒。使用柔軟的無塵紙巾，輕輕擦拭推筒頂端。確保擦掉凹槽中的所有碎屑。
3. 用水徹底清洗注射器管。
4. 將清潔過的推筒滑入注射器中。如果必要，使用少量鹽水。重新將小塑料套管裝入注射器管，然後更換注射器。
 a. 將注射器的套管一端插入底座底部的插槽。
 b. 確保 RBC/Baso/Retic 通道上的輸入口朝向左側，而 Perox 通道上的輸入口朝向右側。
 c. 向上滑動注射器，將其插入泵外殼上的安裝孔中。
 d. 裝上墊圈和螺母，然後用手將螺母擰緊。

警示

注意不要使螺紋交錯，也不要將螺母以及輸入／輸出裝置擰得過緊。

 e. 重新連接所有注射器裝置。
5. 通過以下方法檢查分析儀的性能：
 - 檢查鹽水本底
 - 測試全血標本
 - 測試質控品。

更換進樣器針

分析儀中便用兩個針。一個位於自動進樣器上，另一個位於手動閉管進樣器上。

需要的物品：

- 棉花棒
- 擦鏡紙
- 更換針 PN 113-3301-03

時間：每個針 5 分鐘

分析儀模式：關機

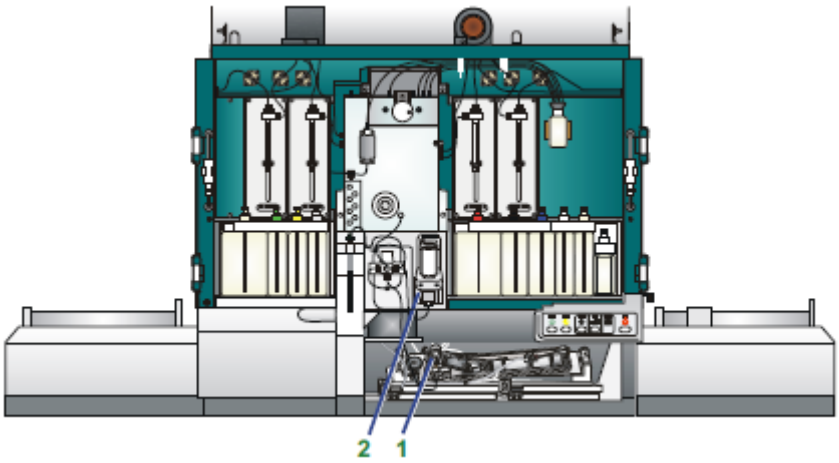
警告

分析儀*必須關機*;否則針可能會造成人身傷害。

進樣器和定心環的位置

► 自動進樣器(1)

► 手動閉管進樣器(2)



生物危害

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要更換檢體針

1. 關閉分析儀。
2. 從自動進樣器或手動閉管進樣器上取下定心環。(有關說明，請參見第 4-6 頁。)
3. 朝逆時針方向轉動針蓋 ↺，鬆開針。
4. 將針連同針蓋一起作爲存在生物危害的物品廢棄。
5. 在裝上替換針之前，使用醮水的棉花棒清潔針座，然後使用另一根醮水棉花棒進行擦拭。

 注意

 如果存在較多殘留物，請使用 25%的家用漂白水溶液和水除去殘留的乾血。

6. 裝上替換針。

 a. 取下針蓋的透明塑料一端(1)。

 b. 裝上紅色針蓋後，朝順時針方向 ↻轉動針以將其裝入針座。注意不要使針的螺紋交錯。

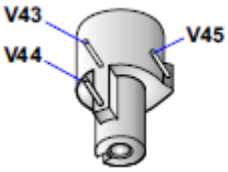
 警示

 不要使用任何其他工具來固定針。擰得過緊會影響針的性能。

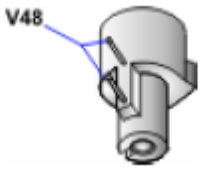
 c. 從針上取下紅色蓋並將其保存起來，供下次安裝針時使用。

7. 將自動進樣哭上的檢體管以外的所有採血管重新連接到定心環

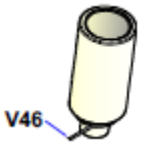
 分析儀定心環

 Autoslide 定心環

 MCTS

 注意

 雙自動進樣器有兩個定心環，一個用於分析儀採樣，一個用於可選的 Autoslide 採樣。兩個定心環都使用一個採樣針。

8. 小心更換針上的定心環。在自動進樣器定心環上，務必將彈簧式旋鈕轉回到其原始位置。
9. 在自動進樣器上，調整自動進樣器吸取裝置的位置。確保該裝置下落到定位鎖上並卡入到位，然後重新將採樣管連接到定心環底座。

警示

調整吸取裝置的位置後，用手擰緊翼形螺釘，注意不要使螺紋交錯。將螺釘擰得過緊會導致底板翹曲，使得進樣器不能正確對齊。翼形螺釘的螺紋交錯會損壞針。

10. 將管朝向自動進樣器定心環的方向，放入 ID 閱讀器一側的”鉤”中。
11. 蓋上前蓋板。
12. 測試鹽水檢體和全血標本，以檢查系統性能。

更換鞘液過濾器

分析儀兩側各有一個鞘液過濾器。Perox 鞘液過濾器位於左側的綠色外殼上，RBC/baso 鞘液過濾器位於儀器右側的透明外殼上。

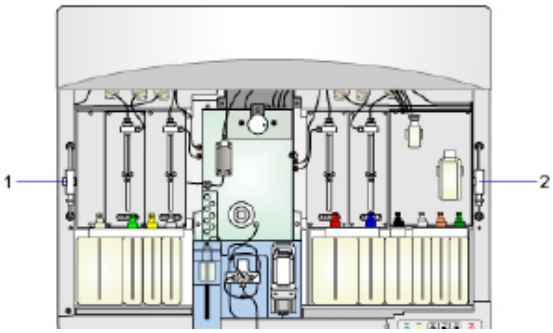
時間：10 分鐘

需要的物品：

- Perox 鞘液過濾器 PN 518-3148-05
- RBC/baso 鞘液過濾器 PN 518-3148-06
- 紙巾

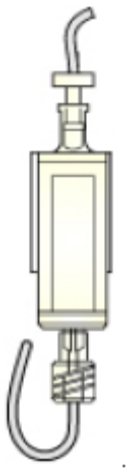
分析儀模式：做好運行準備

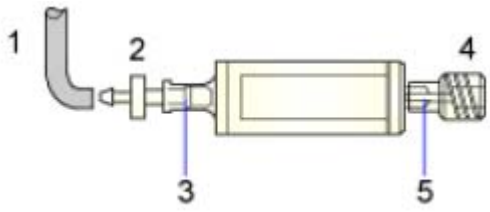
Perox(1)以及 RBC/baso(2)鞘液過濾器的位置



要更換鞘液過濾器

1. 小心朝自己的方向拉出過濾器，拉出的長度讓他能夠將其從安裝處取出並接觸到管道即可。將紙巾墊在過濾器下方，以吸收在取出過濾器時泄漏的所有液體。
2. 斷開連接到倒掛在過濾器輸入口(3)的接頭(2)的試劑管(1)。





3. 從輸出口(5)的接頭斷開 Luer 接頭(4)。請勿從 Luer 接頭斷開管頭。
4. 根據所在地的環保法律和法規丟棄過濾器。
5. 按住替換鞘過過濾器，將 Luer 接頭連接到接口。朝順時針方向 ↻ 轉動 Luer 接頭以固定它。

警示

塑料的倒掛部件和 Luer 接頭很容易碎。自始至終按住替換鞘液過濾器，連接管道時不要使用太大壓力。

6. 仍然按住過濾器的中間位置，將試劑管連接到輸入口的倒掛部件。
7. 將鞘液過濾器插入安裝夾，使過濾器的輸入端朝上。
8. 對試劑管執行 5 次吸取操件。

警示

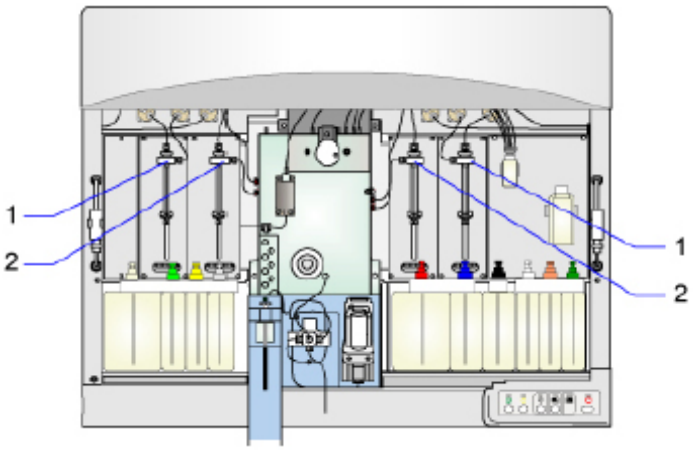
不要使用注射器對過濾器進行吸取。這樣做可能會損過濾器。

9. 查看鞘液過濾器中的液面。如果該過濾器已裝滿大約 90%的容量，再執行 2 次吸取程序。

更換 50 或 1000µL 的注射器推筒 PN 067-506-01 和 067-506-02

需要的物品：

- 小六角扳手
- 家用漂白水
- 檢體注射器修理包，PN 067-B506-01(50 µL)
- 鞘液注射器修理包，PN 067-B506-02(1000 µL)



時間：每個針 5 分鐘

分析儀模式：關機

注意

鞘液注射器推筒(1)將能夠比檢體注射器推筒(2)多使用 2 到 3 次。

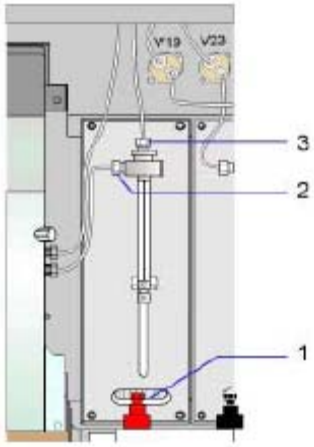
生物危害

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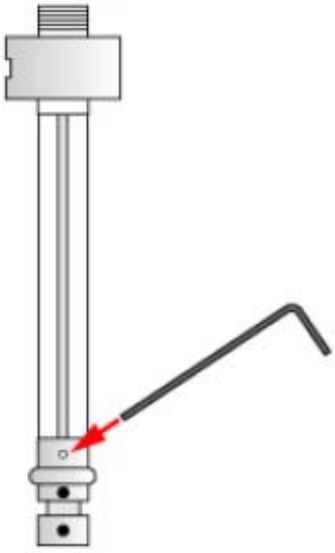
要更換注射器推管

1. 朝逆時針方向 ↺轉動撥輪(1)，直到推筒降低大約 0.5 英寸(1.27 cm)。
2. 從頂部部件斷開管，然後從注射器頂端斷開輸入(2)和輸出(3)部件。
3. 卸下注射器頂端起保護作用的螺母和墊圈。朝底座底部方向向下滑動注射器推筒，然後取下它。



警示

50 µL 的注射器推筒在注射器中有一個小的塑料套管。在更換此推筒時，切勿將推筒從小套管中拉出。這樣做會損壞推筒的頂端。使用小六角扳手或大迴紋針，使套管從注射器中完全彈出，然後從注射器上取下推筒，但套管仍然留在推筒杆上。



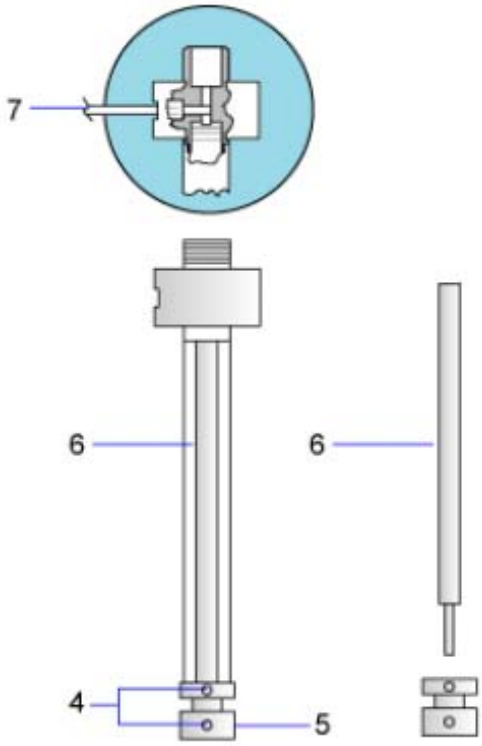
4. 使用六角扳手鬆開推筒杆上的金屬套管(5)上的定位螺釘(4)。取下並保留套管。將推筒(6)丟棄。

5. 檢查注射器。如果內表面較髒，用裝有25%家用漂白水溶液和水的洗瓶清洗它。用水徹底沖洗。

6. 裝上新推筒：

 a. 將修理包中的針規(7)插入注射器的輸入口。

 b. 用鹽水醮濕推筒，然後將其插入注射器管。向上滑動推筒，直到其接觸到針規。



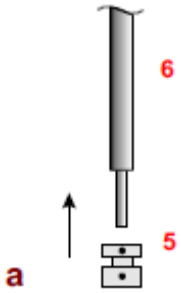
警示

不要強行將推筒插入注射器。這樣做會導致頂端變形。

 c. 在 50-µL 的注射器上，將小塑料套管替換到注射器中。將金屬套管更換到注射器管中，套管的窄環端(5)朝向推筒(6)。

 d. 將金屬套管朝向注射器並向上推，然後固定定位螺釘(4)。

 f. 從輸入口取下針規。



7. 重新裝上檢體注射器：

 a. 將金屬套管一端朝上，將注射器推筒插入底座底部的插槽中。

 b. 向上滑動注射器，將其插入泵外殼上的安裝孔中，使 RBC/Baso/Retic 通道上的輸入口朝向左側，而 Perox 通道上的輸入口朝向右側。

 c. 裝上墊圈和螺母，然後用手將螺母擰緊。

警示

注意不要使螺紋交錯，也不要將螺母以及輸入／輸出裝置擰得過緊。

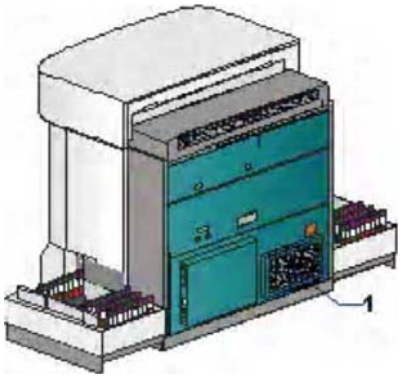
 d. 將所有管重新連接到注射器部件。

8. 通過以下方法檢查分析儀的性能：
 - 檢查鹽水本底
 - 測試全血標本
 - 測試質控品。

如果質控品未能恢復，請校正受影響的通道。

清潔空氣循環過濾器

空氣過濾器的位置(1)

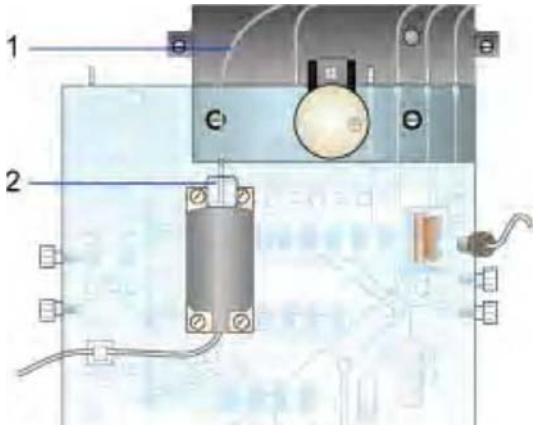


時間：5 分鐘

要清潔空氣過濾器

1. 向右滑動過濾器，使其脫離外殼以將其取下。
2. 在清潔、堅硬的表面上敲打過濾器，或對其進行真空洗塵處理，去除多餘的灰塵或線頭。
3. 使用較大水流沖洗過濾器，先沖一面，再沖另一面。
4. 如果過濾器仍然較髒，在裝有溫水和柔和清潔劑的容器中清洗它。
5. 用清水沖洗過濾器，然後讓其自然風乾。

檢查 Perox - Cap 通氣孔中是否存在殘留物質



1. 將溢流管(1)從 Perox 通氣孔斷開。
2. 取下蓋帽(2)。
3. 查看蓋帽內部，然後檢查通風開口。確保蓋帽和通風孔清潔、乾燥且沒有殘留物。

4. 如果需要，清潔蓋帽和通風開口。使用流通池清潔包(**PN 113-B711-01**)中附帶的鑽頭，清潔通風開口中的阻塞物。

5. 更換蓋帽並重新連接溢流管。

清潔自動進樣器吸取裝置

清潔自動進樣器吸取裝置中殘留的鹽質。

生物危害

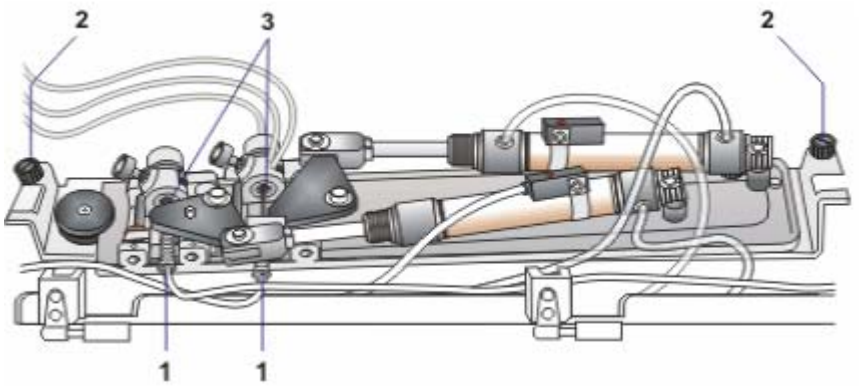
對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

操作者應按照建議進行操作對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

時間：15 分鐘

- 需要的物品：
- 棉花棒
- 去離子水紙巾
- 噴瓶

分析儀模式：關機



要清潔自動進樣器吸取裝置

1. 關閉分析儀。
2. 向下轉動前蓋板。
3. 用去離子水徹底沖洗自動進樣器吸取裝置。

注意

單個吸取裝置上有一個針、定心環和空氣瓶。

4. 從針座底部取下檢體管(1)。

警示

必須先取下檢體管，然後才能向前轉動吸取裝置。如果將管保持在原位不動，則轉動該裝置時會導致管破裂。

5. 鬆開翼形螺釘(2)並向前轉動自動進樣器吸取裝置，然後用去離子水徹底沖洗該裝置的背面。
6. 清潔定心環。確保去除定心環和該裝置的配合面(3)上的所有殘留物。
7. 放置 5 分鐘，然後用紙巾和棉花棒將該裝置擦乾。如有必要，重複該操作。
8. 重新安裝該裝置。確保將該裝置安裝到位，然後重新連接檢體管。



警示

調整吸取裝置的位置後，用手擰緊翼形螺釘，注意不要使螺紋交錯。將螺釘擰得過緊會導致底板翹曲，使得進樣器不能正確對齊。翼形螺釘的螺紋交錯會損壞針。

9. 將管朝向定心環的方向，放入 ID 閱讀器一側的”鉤”中。

分析儀故障排查

校正和調整 3

調整血紅素基準值 3
調整檢體探針的長度 4
調整氣動調節器 4
使 PEROX 燈輸出最大化 5
爲手動條碼閱讀器重新編程 6

清潔過程 6

反沖排放裝置過濾器 6
清潔 PEROX 腔室 8
清潔自動進樣器沖洗液至廢液管（V45 通道） 9
清潔通風管、真空緩沖區和反應倉 10
FLOWCELL WASH（流通池沖洗） 11
在分析儀上清潔流通池 12
在分析儀外清潔流通池 13
在分析儀外清潔流通池：步驟 1 取下 PEROX 流通池 15
在分析儀外清潔流通池：步驟 2 取下 RBC/BASO/RETIC 流通池 17
在分析儀外清潔流通池：步驟 3 將流通池拆開 19
在分析儀外清潔流通池：步驟 4 清潔 CFM 19
在分析儀外清潔流通池：步驟 5 沖洗流通池和 CFM 20
在分析儀外清潔流通池：步驟 6 清潔流通池的玻璃窗口 20
在分析儀外清潔流通池：步驟 7 裝回流通池 21
在分析儀外清潔流通池：步驟 8 檢查分析儀性能 22
反沖 PEROX 流通池以及氣壓箱和反應池 22
反沖 RBC/BASO/RETIC 流通池以及氣壓箱和反應池 24

修理與更換 26

更換凝塊過濾器 26
更換隔膜泵 27
更換排放裝置過濾器 28
更換 PEROX 止回閥 30
更換前分血片或分血閥轉子 30
更換保險絲 31
更換血紅素光度計燈泡 33
更換液壓閥 34
更換開管進樣器探針 36
更換 PEROX 燈 37
更換 PEROX 流通池 39
更換 RBC/BASO/RETIC 流通池 41
更換注射器 45
更換真空泵過濾器（通氣過濾器） 45
更換清洗模組 46

故障排除技巧 47

自動進樣器故障排除技巧 47
無法找到視頻 48
檢查排放裝置過濾器是否阻塞 48
壓縮機無法啓動 48
數據管理器與 LIS 48
觀看視頻時沒有聲音 49
PEROX 腔室 49

如果您無法解決問題並需要維修幫助，請與您當地的技術支持提供商或代理商聯繫。

校正和調整

調整血紅素基準值

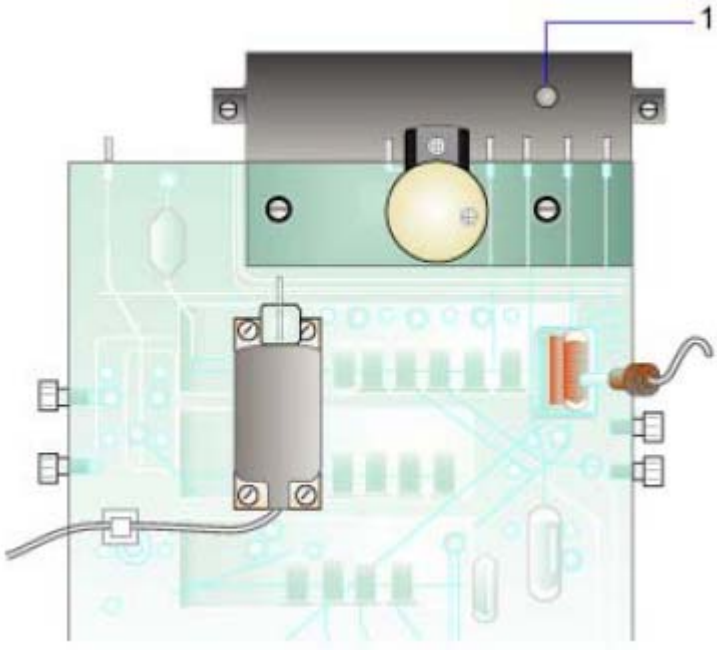
底調整血紅素光度計燈泡基準值的情況

- 更換燈之後。
- 基準值>4.2 伏時。
- 在排查故障的過程中指示這樣做時。

要調整血紅素基準值

1. 在 Procedures（過程）菜單中，選擇 **Adjust Lamp/Temp（調整燈／溫度）**選項。
2. 選擇 **Hgb Baseline（血紅素基準值）**。
3. 使光度計上的白色小塞子彈出，以便能夠接觸到血紅素電源前置放大電路板上的電位計調整螺釘。

血紅素電源前置放大板上的電位計(1)



4. 選擇 **Start Cycle（開始周期）**。在分析儀檢查基準值的同時，使用小螺絲刀旋轉調整螺釘，使 **Current（電流）**值爲 **4.1**。

 要增加該值，朝順時針方向轉動螺釘。

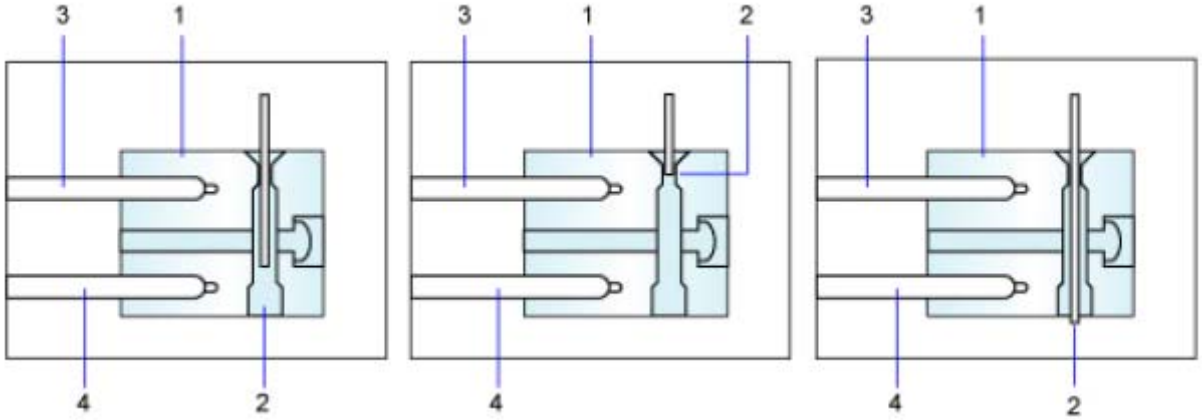
 要減小該值，朝逆時針方向轉動螺釘。

5. 選擇 **Exit（退出）**，然後更換塑料塞。

調整檢體探針的長度

在每次吸取後，清洗模組(1)會降低並且會在該模組中清洗探針。要進行正確清洗，當清洗模組效於其最低位置時，探針(2)的終端必須位於清洗模組的上口(3)和下口(4)之間。

正確校正探針 **必須更換探針** **需要校正探針**



1. 查看降低的清洗模組中的探針終端。如果探針過短，則必須更換探針。
2. 如果探針過長，請取下探針，然後使用鋒利的解剖刀或刮鬍刀片，將探針整齊地切割到適當長度。要非常小心地切割，使切口整齊，沒有毛邊。*切探針的時候不要傾斜。*
3. 更換探針並檢查長度。

調整氣動調節器

1. 要接觸到旋鈕，彈開分析儀右側的白色面板。使用十字頭螺絲刀將綠色小面板拆下。
2. 在 Utilities（工具）菜單中，選擇 **Analyzer Status（分析儀狀態）**。
3. 調整相對旋鈕時，監測螢幕上的氣動值。

20 英寸汞柱真空調節器旋鈕　5 磅／平方英寸壓力調節器旋鈕



40 磅／平方英寸壓力調節器旋鈕　20 磅／平方英寸壓力調節器旋鈕

按順時針方向旋轉旋鈕使值增加，逆時針方向旋轉則使值減少。

首先要拉出 20 磅／平方英寸壓力調節器旋鈕和 40 磅／平方英寸壓力調器旋鈕，然後旋轉其進行調整。

調節器	可接受的讀數	設置爲
20 英寸汞柱真空	20 ± 1 英寸汞柱	20 + 0.5 英寸汞柱
20 磅／平方英寸壓力	20 ± 1 磅／平方英寸	20 + 1 磅／平方英寸
5 磅／平方英寸壓力	5 ± 0.5 磅／平方英寸	5 + 0.25 磅／平方英寸
40 磅／平方英寸壓力	40 ± 2 磅／平方英寸	40 + 1 磅／平方英寸

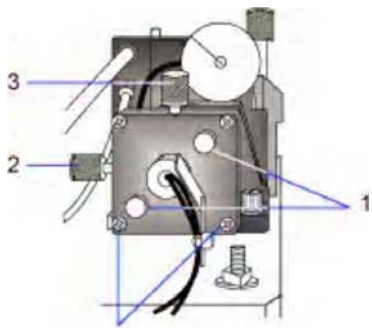
重要訊息

只能向上或按順時針方向轉動旋鈕來獲得所有氣動設置。如果讀數高於目標值（參見左側的 3 欄），回轉旋鈕。讓分析儀進行配平（每 5 秒得到一個新讀數），然後向上調整以糾正值。

使 Perox 燈輸出最大化

分析儀應處於 **Ready to Run（準備運行）**模式。如果其處於 **Standby（待機）**模式，則當前 A/D 讀數將不會更新。

1. 在 Procedures（過程）菜單中，選擇 **Adjust Lamp/Temp（調整燈／溫度）**。
2. 選擇 **Perox Lamp Alignment（Perox 燈對齊）**。
3. 選擇 **Start Cycle（開始周期）**。
4. 監測 **Current A/D Reading（自前 A/D 讀數）**字段。
5. 鬆開兩個固定螺釘(1)。不要鬆開四角螺釘(4)。
6. 即便燈的初始最高值高於 1.96，也要執行下列過程。使用側邊對齊螺釘（水平方向移動燈）(2)和頂部對齊螺釘（垂直方向移動燈）(3)使燈達到最高位置。最高值應在 1.96 至 4.99 伏之間。但如果值高於 4.90 伏，應先選擇 **Set Light Intensity（設置光強）**，然後返回 Perox Lamp Adjustment（調整 Perox 燈）窗口，選擇 **Start Cycles（開始周期）**，重複這個過程。



 a. 朝順時針方向先轉動側邊螺釘，然後轉動頂部螺釘，每次以小幅增加電壓。如果電壓下降，按逆時針方向轉動螺釘。

 b. 繼續交替轉動螺釘，小幅增加電壓，直至達到最高值。最後調整應以順時針方向進行。每次增加電壓時，等待 5 至 10 秒以便更新螢幕。

注意

達到燈的最終最高值時只能朝順時針方向進行調整。這樣才能抵消可能會隨時間推移降低燈的輸出水平的任何彈動。

7. 達到最高值後，擰緊固定螺釘(**1**)將燈鎖定入位。有一些小偏差（低於 0.1 伏）是正常的。

8. 在 Utilities（工具）菜單中，選擇 **Analyzer Status（分析儀狀態）**，並檢查光強。

- 如果值至少爲 120 但低於 255，盡管 perox 光源指示燈爲紅色，但此時的值是可以接受用來報告結果的。此時不會標記結果。檢查 perox 通道的增益，並繼續正常操作。
- 如果值低於 119，選擇 **Set Light Intensity（設置光強）**。檢查 Perox 通道的增益。

爲手動條碼閱埃器重新編程

1. 在 Opticon 用戶手冊中找到 **Codabar Settings（條碼設置）**。
2. 使用閱讀器掃描 **Start（開始）**(Z7)條碼。條碼閱讀器會發出持續的嘟嘟聲，表明其正處於編程模式。
3. 掃描 **Do not transmit Start/Stop（不要傳輸開始／停止）**(F0)條碼。掃描成功時，您會聽到一聲尖銳的響聲。
4. 掃描 **End（結束）**(Z7)條碼標籤。持續的嘟嘟聲表明重新編程完成。

清潔過程

反沖排放裝置過濾器

如果排放裝置過濾器阻塞，更換一個新過濾器。

如果過濾器未阻塞，但由於殘留物或污垢過重而想要清潔時，使用此反沖過程。

所需物品：

- 流通池清洗包，PN 113-B711-01
- 家用漂白劑

時間：10 分鐘

分析儀模式：Off（關機）

分析儀故障排查



生物危害

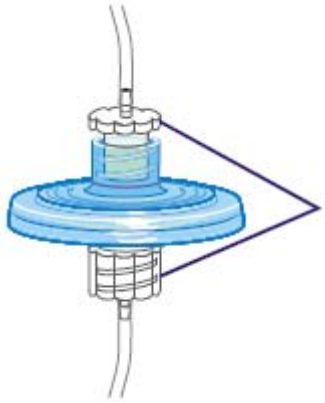
對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

操作者應按照建議進行操作對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS)M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

要反沖排放裝置過濾器

1. 關閉分析儀。
2. 準備好 10%的家用漂白劑溶液。
3. 從要沖洗的排放裝置過濾器各端將各接頭取下。
4. 將注射器連接到過濾器底部。
5. 將過濾器放入裝有漂白劑溶液的燒杯中。輕輕拉出

 注射器推筒，將液體吸過過濾器。確保液體流向與正常操作中的流向相反。
6. 斷開注射器，將其清空。

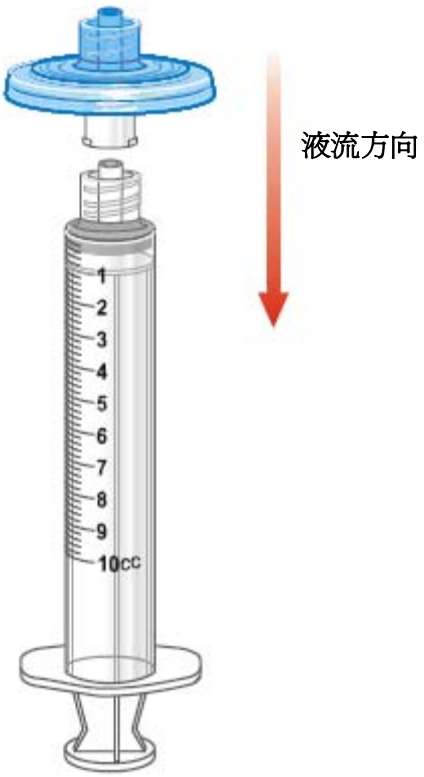


將兩個接頭都取下

警告

從排放裝置過濾器上沖洗下的碎屑可能含有存在生物危害的物質，應對其進行處理以防止傳播傳染病。

7. 使用去離子水代替漂白劑溶液，重複步驟 4 至步驟 6 兩次，沖洗過濾器。
8. 目測檢查過濾器，如有必要，重複該過程。
9. 使用無塵布或吸水紙擦拭過濾器外部。
10. 重新安裝排放裝置過濾器。



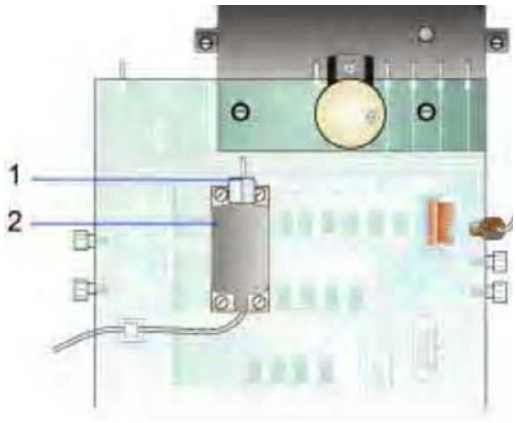
11. 用 10%家用漂白劑溶液清潔注射器。
12. 打開分析儀，以手動和自動進樣器模式運行檢體。檢查確定有無泄漏，及液體是否正常通過過濾器。確保各種管線不會妨礙自動進樣器吸取裝置的運動。

所需物品：

- 棉花棒
- 口腔鏡
- EZ KLEEN
- 手電筒

時間：2 分鐘

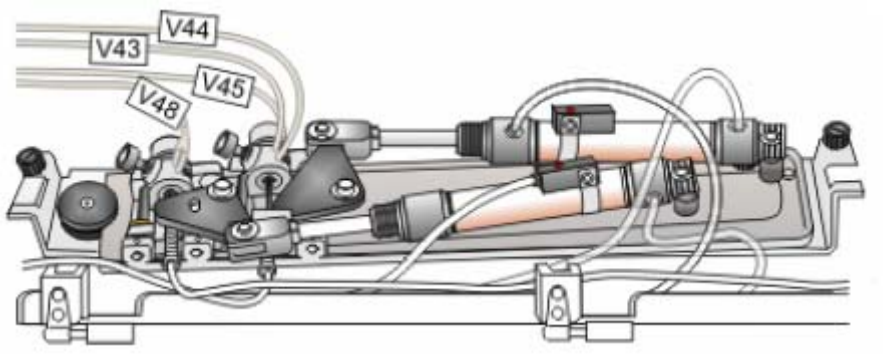
分析儀模式：準備運行

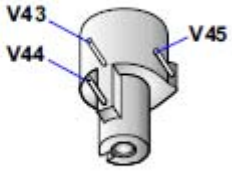


1 PEROX
2 PEROX

1. 取下 perox 腔室蓋帽
2. 用乾淨的棉花棒醮取 EZ KLEEN 將 perox 腔室內部擦拭乾淨。

1. 打開前蓋板。
2. 在 Utilities（工具）菜單中，選擇 Exercise（執行）選項，然後選擇左側的 **Valves（閥）**按鈕。
3. 從自動進樣器定心環上的 **V45** 接頭拔下管。





3. 打開要創建真空環境的閥，將燒杯中漂白劑溶液經通風管和箱吸取到 UFC 裝置底部的主廢液管。

 要打開閥，在 Utilities（工具）菜單中，選擇 **Exerciser（執行）**選項。從左側的列表中選擇 **Valves（閥）**。選擇相應的閥。

 各箱相應的閥力：

 嗜鹼性粒細胞箱：打開 V13

 Perox 真空緩衝區：打開 V18 和 V17

 網狀紅血球箱：打開 V65

 紅血球箱：打開 V10

 RBC/baso/retic 真空緩衝區：打開 V22 和 V21

 血紅素箱：打開 V36

4. 使家用漂白劑溶液和空氣交替通過管和箱，直至清潔乾淨爲止。
5. 將管的自由端插入裝有去離子水的燒杯中沖洗管和箱。
6. 將管從燒杯中取出，關閉閥。
7. 退出 **Exerciser（執行）**。
8. 更換連接到溢流瓶中的管，如果是非溢流管，將其從通風口取下。
9. 在 **Startup（啓動）**窗口中，選擇 **Refresh（刷新）**。重複 **Refresh（刷新）**直至本底計數可接受。
10. 測試品管品並驗證結果是否處於規格範圍內。

Flowcell Wash（流通池沖洗）

這是一個沖洗阻塞流通池的功能，可以在 **Hydraulic Functions（清洗功能）**選項中找到。

要沖洗 Perox 流通池，使用 EZ KLEEN。

要沖洗 RBC/baso/retic 流通池，使用 25%的家用漂白劑水溶液。要同時沖洗這兩個流通池，使用 EZ KLEEN。

1. 選擇 **Flowcell wash（流通池沖洗）**來加以選擇。
2. 通過在 Flowcell Options（流通池選項）區中點擊某一選項選擇要沖洗的流通池。
 - Perox 流通池
 - RBC/Baso/Retic 流通池
 - 二者皆選

3. 將一管 EZ KLEEN（perox 流通池）或漂白液（RBC/baso/retic 流通池）放在開管進樣器探針下。

 重要訊息
 不要按吸液板。

4. 選擇 **Start（開始）**來開始沖洗流通池。繼續將管放在探針下，直至聽到一聲信號音且清洗模組開始降低（約 100 秒）。

 可以選擇 **Cancel（取消）**來停止流通池沖洗。它會在當前周期結束後停止。

在分析儀上清潔流通池

這種流通池清潔方式會避過分血閥和 UFC 通道。

所需物品

- 燒杯
- 家用漂白劑
- 時間：10 分鐘

分析儀模式：準備運行



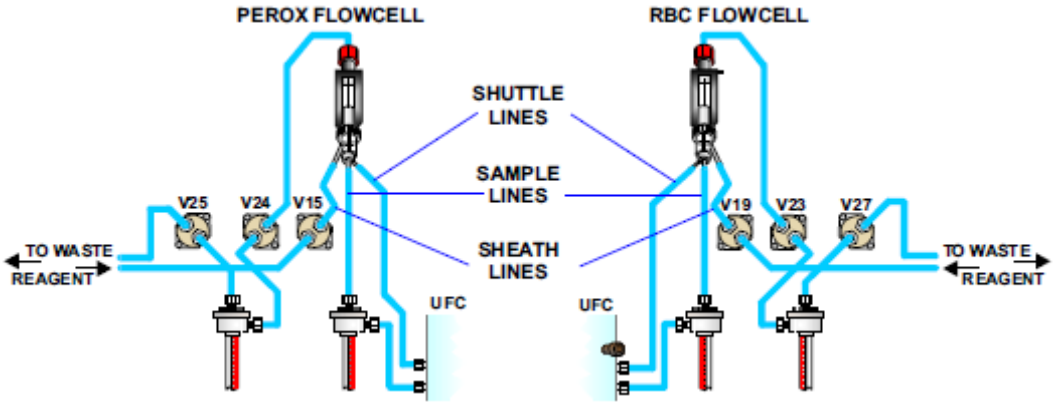
生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

操作者應按照建議進行操作對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

要清潔 perox 或紅血球流通池而不將其從分析儀上取下

每個流通池有 3 根相關聯管。通常，只清潔檢體管。可用同樣方法清潔沖洗管和氣壓管。



1. 將檢體管從檢體注射器斷開，把末端浸入裝有 25%家用漂白劑溶液的燒杯中。
2. 在 Utilities（工具）菜單中，選擇 **Exerciser（執行）**選項，然後選擇左側的 **Valves（閥）**。

如果正在清潔紅血球流通池，選擇 **V23** 和 **V27**。

如果正在清潔 perox 流通池，選擇 **V25** 和 **V24**。

3. 使家用漂白劑溶液和空氣交替經檢體管抽出。
4. 用燒杯裝水，將水經管中抽出以沖洗管。
5. 更換檢體管並關閉所有閥。
6. 要清潔鞘液管或氣壓管，請遵循以下過程。

 清潔鞘液管時，從 perox 鞘液管所連的 V15 或紅血球鞘液管所連的 V19 上將管拔下。

 清潔氣壓管時，從 UFC 接頭將管拔下。

在分析儀外清潔流通池

需要清潔流通池的情況：

- ► 流通池或同心流模組(CFM)阻塞
- ► 流通池窗口髒污

需要的物品：

- ADVIA OPTIpoint
- ADVIA TESTpoint 質控品
- EZ KLEEN，產品編號 T01-3624
- 流通池清洗包，PN 113-B711-01

其中包括：

- ◆ 鑽頭
- ◆ 針清洗包，PN 113-B911-01
 - 聯結器
 - 一次性注射器
 - Luer 接口
- ◆ 手鑽

- 家用漂白劑
- 擦鏡紙
- 一條 6 英寸(15.2 cm)長的 0.020 英寸(0.5 mm)內徑 C-Flex 管，PN 562-3052P02
- 兩個 50 mL 燒杯

注射器準備

時間：更換－10 分鐘
檢查－30 分鐘

分析儀模式：待機

要取下並清潔流通池

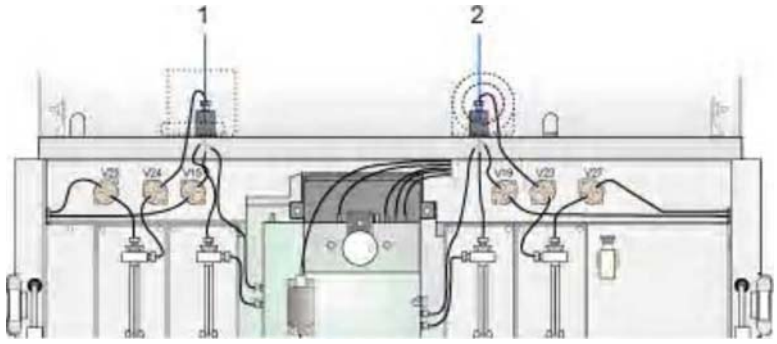
1. 取下流通池。每個流通池適用不同的過程。
2. 將流通池拆下。
3. 清潔 CFM。
4. 沖洗流通池和 CFM。
5. 清潔流通池的玻璃窗口。
6. 將流通池放回原位。
7. 檢查分析儀性能。

請參見下面的詳細步驟。

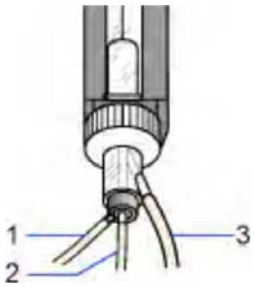
在分析儀外清潔流通池：步驟 1

取下 Perox 流通池

1. 確保分析儀處於 Standby（待機）模式。
2. 打開光學器件蓋板。perox 流通池在左側。Perox 流通池(1)，紅血球流通池(2)

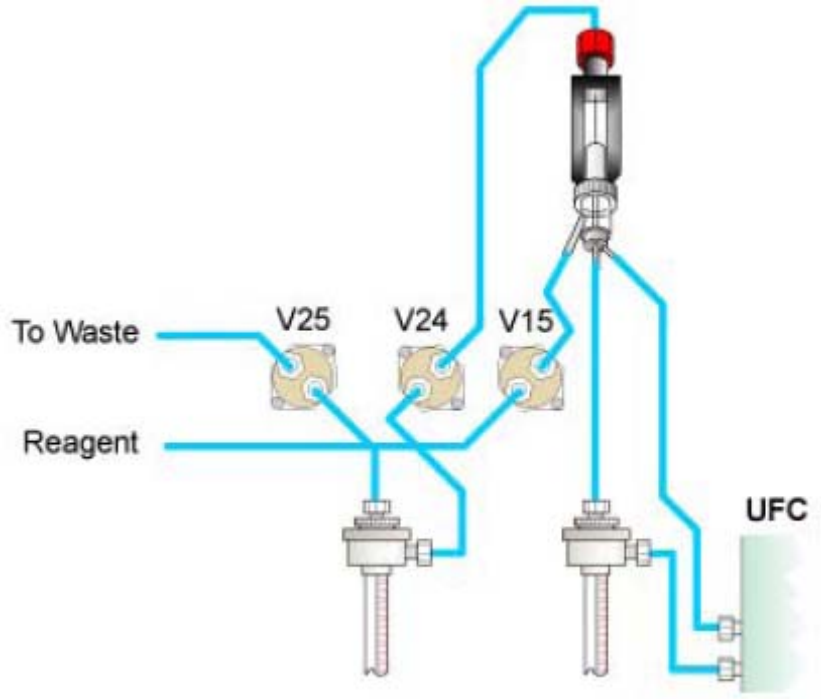


3. 將氣壓管(1)、檢體流輸入管(2)及鞘液輸入管(3)從 CFM 斷開。讓這些管自由垂下。



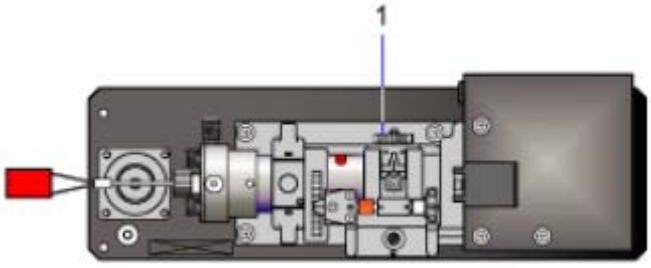
1 鞘液接頭
2 檢體接頭
3 氣壓接頭

4. 找到液壓閥#24，將閥右上端的螺紋接頭打開。

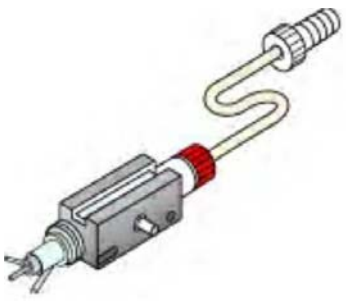


5. 打開位於流通池調整裝置右側的釋放旋鈕，將流通池取下

流通池釋放旋鈕(1) → 分析儀前端



6. 抓住流通池頂部的紅色螺紋接頭，將流通池輕輕提起，從光學器件裝置中取出。



警示

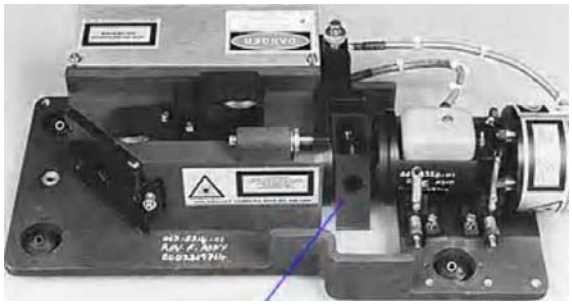
爲避免在流通池的玻璃窗口上留下指痕，應始終拿握流通池的金屬片部分。

在分析儀外清潔流通池：步驟 2
取下 RBC/BASO/Retic 流通池

在進行 RBC/baso/retic 流通池清潔前，請閱讀所有激光危害預防措施。

警告

為避免因激光輻射造成受傷，不要取下激光防護屏。如果激光光學器件裝置上激光防護屏未就位，不得取下流通池。



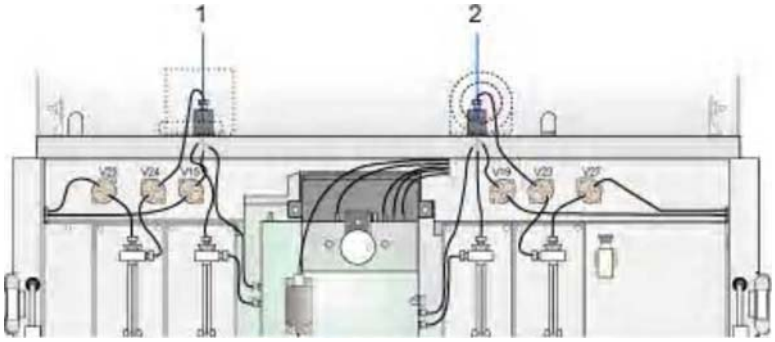
激光防護屏
不要取下！

有關激光的警告

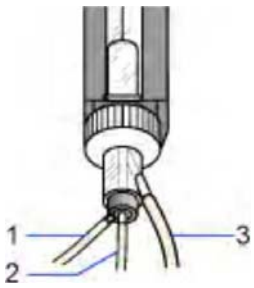
為避免仿害眼睛，切勿直視激光光束或明亮表面反射的激光光束。必須嚴格遵循所有現場維修過程。只有經過 Siemens 培訓的現場維修人員可以執行與激光裝置相關的操作。

有關更詳細的安全訊息和激光規格，請參考安全訊息、防止受到激光傷害。

1. 確保分析儀處於 Standby（待機）模式。
2. 打開光學器件蓋板。紅血球流通池在左側。
 Perox 流通池(1)，紅血球流通池(2)

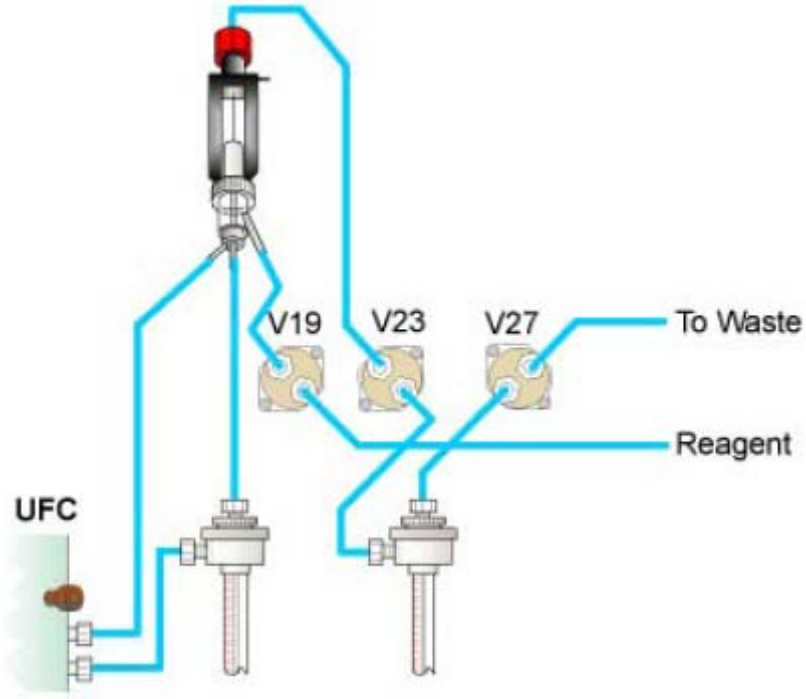


3. 將氣壓管(1)、檢體流輸入管(2)及鞘液輸入管(3)從 CFM 斷開。讓這些管自由垂下。

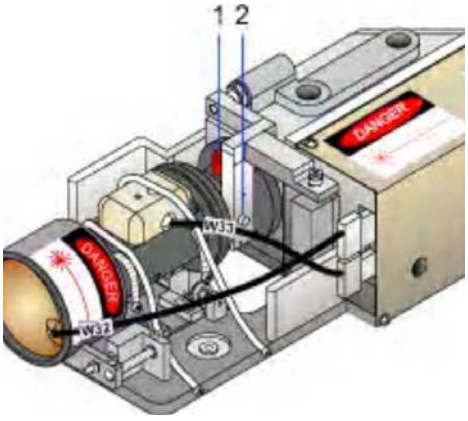


1 **鞘液接頭**
2 **檢體接頭**
3 **氣壓接頭**

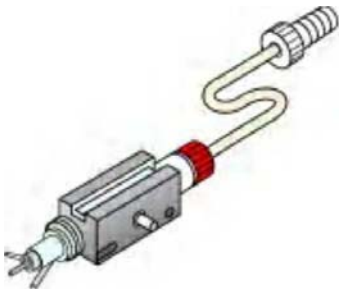
4. 找到液壓閥＃23。從閥左上端擰下螺紋接頭。



5. 擰開緊固型流通池釋放螺釘，然後取下流通池。
流通池(1)，流通池釋放螺釘(2)



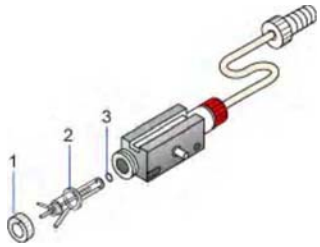
6. 抓住流通池上的紅色螺紋接頭，同時將其提起，從光學器件裝置中取出。



警示

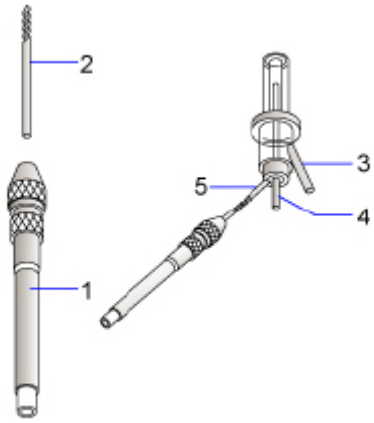
為避免在流通池的玻璃窗口上留下指痕，應始終拿握流通池的金屬片部分。

在分析儀外清潔流通池：步驟 3
將流通池拆開



1. 打開流通池裝置輸入端的鎖緊螺母(1)。
2. 扭轉 CFM (2)，將其從流通池上取下。
3. 注意不要遺失 O 形密封圈(3)。

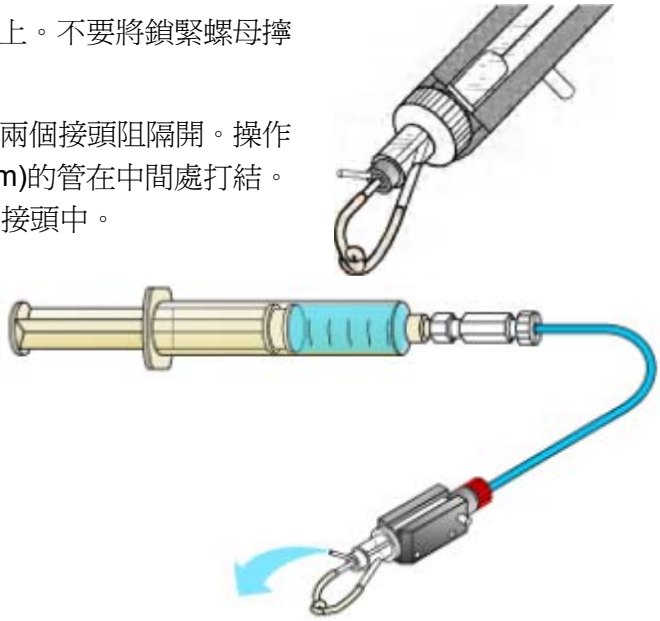
在分析儀外清潔流通池：步驟 4
清潔 CFM



1. 流通池清潔包中附帶一支手鑽(1)和一個直徑 1/64 英寸(0.4 mm)的鑽頭(2)。打開手鑽，將鑽頭向鑽口中插入約 1/4 英寸(6.4 mm)，然後擰緊手鑽。
2. 將鑽頭插入鞘液接頭(3)。小心扭動鑽頭令其通過鞘液接頭。如果碰到阻塞，扭動鑽頭的同時緩緩前進。
3. 對檢體輸入接頭(4)重複步驟 2。
4. 小心地將鑽頭插入氣壓接頭(5)，深度應至鑽頭的凹槽剛好留在接頭尾端之外。擰動鑽頭數次，然後將其從接頭中取出。

在分析儀外清潔流通池：步驟 5
沖洗流通池和 CFM

1. 將 CFM 重新連接到流通池裝置上。不要將鎖緊螺母擰得過緊。
2. 要單獨沖洗每個接頭，應將其他兩個接頭阻隔開。操作如下：將一根內徑 0.020(0.5 mm)的管在中間處打結。將管的兩端連接到不進行沖洗的接頭中。
3. 用注射器吸取 10 mL 的 25% 漂白劑水溶液。將注射器和適配器連接到流通池一管一裝置接頭。



4. 操作應在水槽上方進行，小心地推壓推筒，將注射器中的內容物推過流通池，從開放的接頭處流出。
5. 將打結管的一端轉接到清潔後的接頭上。
6. 斷開注射器及適配器，在注射器內吸入 10mL 相應液體。用當前經第二個接頭排出的液體沖洗流通池。
7. 對第三個接頭重複沖洗過程。
8. 重複步驟 2 至 7，用水沖洗流通池和 CFM。
9. 從流通池管裝置接頭上取下注射器及適配器。

在分析儀外清潔流通池：步驟 6
清清流通池的玻璃窗口

1. 將一張擦鏡紙折疊起來，令其一邊略窄於光學玻璃窗口。

警示

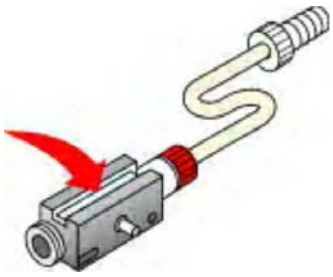
為避免手上的東西粘到光學表面（玻璃窗口），不要觸碰擦鏡紙將要接觸玻璃窗口的部分。

2. 將擦鏡紙窄邊浸入甲醇。

警示

由於不純的甲醇會在窗口上留下一層膜，因此只使用未受污染的。

3. 輕輕擦拭玻璃表面的一面。丟棄用過的擦鏡紙。爲防止形成甲醇膜，用乾淨的擦鏡紙將玻璃徹底擦乾。

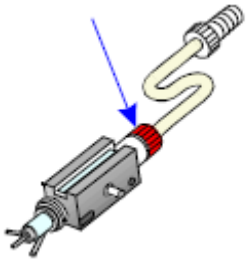


4. 檢查表面是否乾淨。如窗口不夠乾淨，重複第 1 步至第 3 步。
5. 重複第 1 步至第 4 步清潔另一個光學窗口。

在分析儀外清潔流通池：步驟 7

裝回流通池

1. 抓住流通池上的紅色螺紋接頭，將其輕輕放入光學器件裝置。



2. Perox 光宇裝置

 擰緊釋放旋鈕，將流通池鎖定入位。

 RBC/baso/retic 光學裝置

 將流通池放置到定位銷上。確保流通池固定在兩個定位銷上。流通池角度應爲 4。擰緊流通池釋放螺釘。

3. 將液壓管重新連接到 CFM。將流通池管裝置接頭重新連接到相應液壓閥上（V24 閥用於 perox, V23 閥用於紅血球）。手動將連接處打緊以防止泄漏。

 重要訊息

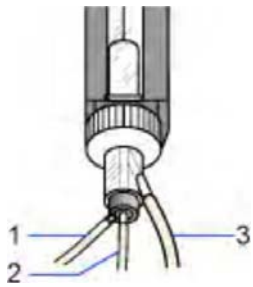
 爲避免患者數據錯誤，確保每個液壓管都連接到正確的 CFM 接頭上。

 來自 UFC 裝置的氣壓管(3)

 來自注射器的檢體管(2)

 來自液壓閥的鞘液管(1)

 V15 — perox 或 V19 —紅血球



在分析儀外清潔流通池：步驟 8
檢查分析儀性能

重要訊息

必須爲此過程提供檢查範圍。除非接受這校正與聚焦流通池的培訓，否則不要將其取下。

1. 將分析儀置於 **Ready to Run（準備運行）**模式。
2. 在 Operations（操作）菜單中，選擇 **Startup（啓動）**，然後選擇 **Refresh（刷新）**，並驗證本底計數。
3. 檢查流通池連接處是否有泄漏。
4. 檢查流通池的聚焦和校正情況。
5. 檢查 gains 值。
6. 測試一份全血標本，然後測試品管品來驗證分析儀性能。
7. 如果質控品結果對實驗室來說可以接受，無需採取其它措施，可恢復正常操作。

反沖 **Perox** 流通池以及氣壓箱和反應池

所需物品：

- 流通池清洗包，PN 113-B711-01
- EZ KLEEN 燒杯
- 去離子水

分析儀模式：做好運行準備



生物危害

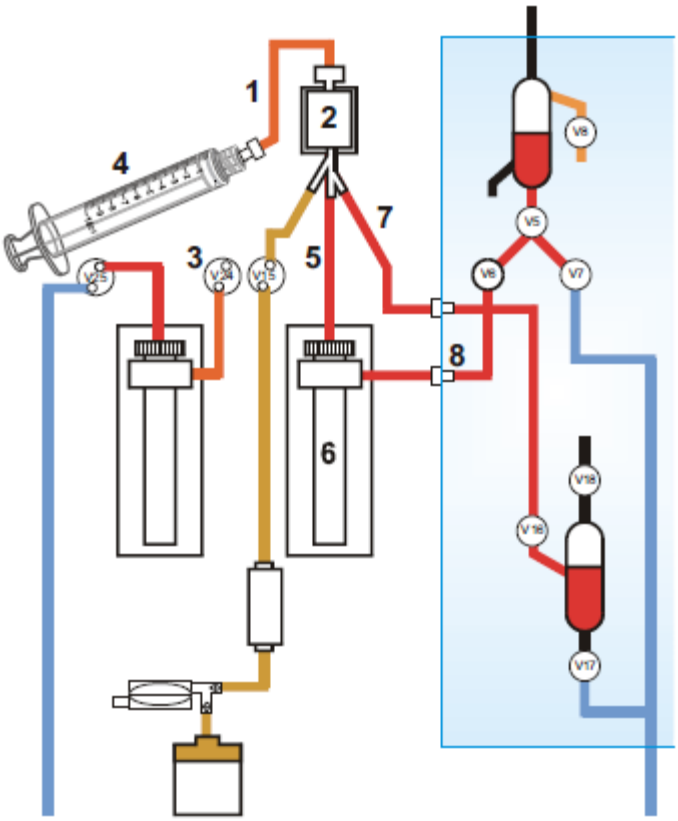
對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

警示

在執行該操作時，不能太用力。

1. 在 Utilities（工具）菜單中，選擇 **Exerciser（執行）**，打開 Exerciser 選項。
2. 在 V24 處斷開來自 Perox 流通池(2)的廢液管(1)。即 V24 (3)處的白色接頭。
3. 向清潔用注射器(4)中加入 EZ KLEEN，連接到此白色接頭上。在後續步驟中，按需要向注射器中補加 EZ KLEEN。
4. 將檢體管(5)從檢體注射器(6)頂部斷開，放入燒杯中以接取反沖流通池時的液體。
5. 輕推清潔用注射器的推筒，令 EZ KLEEN 流經 Perox 流通池(2)進行沖洗。使用去離子水重複此過程。
6. 將檢體管(5)接回至檢體注射器(6)的頂部



7. 在注射器中重新加入 EZ KLEEN。
8. 將氣壓管(7)從 UFC (8)側邊斷開，將檢體管放入燒杯中以接取反沖流通池時的液體。
9. 輕推清潔用注射器的推筒，令 EZ KLEEN 流經 Perox 流通池(2)進行沖洗。使用去離子水重複此過程。
10. 將氣壓管(7)接回 UFC (8)的側邊。
11. 在注射器中重新加入 EZ KLEEN。
12. 在 **Exerciser（執行）**選項的 Valves（閥）窗口中，打開 V16 和 V17，然後推動注射器令 EZ KLEEN 流經氣壓通道至 VSC 池。使用去離子水重複此過程，然後關閉 V16 和 V17。
13. 在注射器中重新加入 EZ KLEEN。

14. 在 Exerciser（執行）選項的 Valves（閥）窗口中，打開 V5 和 V6。取下 Perox 腔室蓋帽，然後推壓注射器將內容物注入箱中。箱被注滿時，打開 V7 排空。關閉 V7。使用去離子水重複，然後關閉 V5、V6 和 V7。
15. 將注射器(4)從白色接頭上取下。
16. 將管重新連接到 V24 (3)的接頭上。
17. 選擇 **Analyzer Status（分析儀狀態）**選項退出 Exerciser（執行）。
18. 打開 **Hydraulic Functions（清洗功能）**選項，然後執行 System Wash（系統清洗）周期。
19. 測試品管品驗證系統性能。

反沖 RBC/baso/retic 流通池以及氣壓箱和反應池

所需物品：

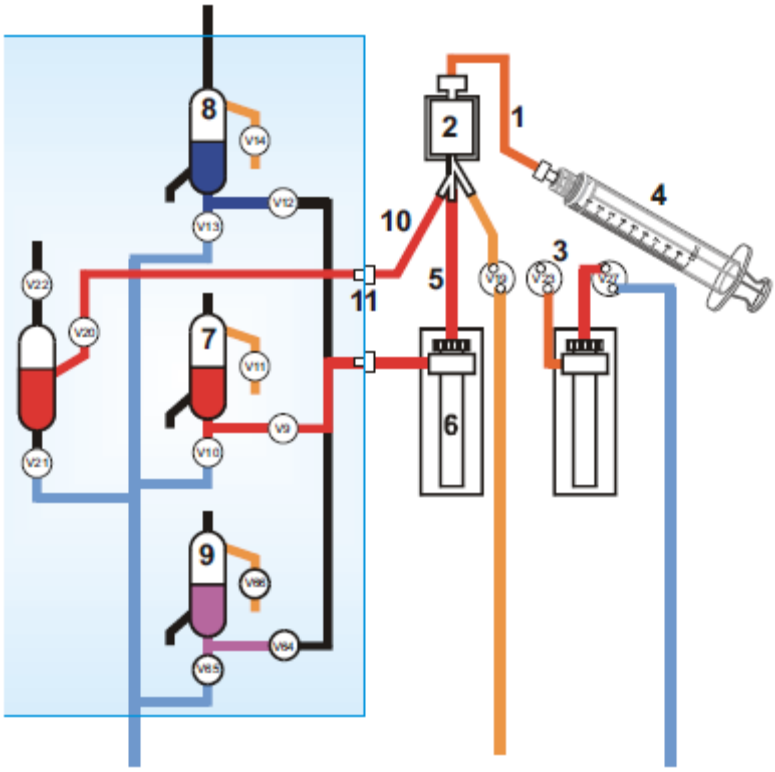
- 流通池清洗包，PN 113-B711-01
- EZ KLEEN 燒杯
- 去離子水

分析儀模式：做好運行準備

警示

在執行該操作時，不能太用力。

1. Utilities（工具）菜單中，選擇 **Exerciser（執行）**來打開 Exerciser 選項。
2. 在 V23 處斷開來自紅血球流通池(2)的廢液管(1)。即 v23 (3)效的白色接頭。
3. 向清潔用注射器(4)加入 25%家用漂白劑溶液，並將其連接到此白色接頭上。在後續步驟中，按需要向注射器中重新加入漂白劑溶液。



4. 將檢體管(5)從檢體注射器(6)頂部斷開，放入燒杯中以接取反沖流通池時的液體。
5. 輕推清潔用注射器的推筒，令漂白劑溶液流經紅血球流通池(2)進行沖洗。使用去離子水重複此過程。
6. 將檢體管(5)接回檢體注射器(6)的頂部。
7. 在注射器中重新加入漂白劑溶液。
8. 在 Exerciser（執行）選項的 Valves（閥）窗口中，打開 V9，然後推動注射器將 25%漂白劑溶液注入紅血球箱(7)，然後打開 V10 排空。關閉 V9 和 V10。使用去離子水重複。
9. 在注射器中重新加入漂白劑溶液。
10. 在 **Exerciser（執行）**選項的 **Valves（閥）**窗口中，打開 V12，然後推動注射器將漂白劑溶液注入 Baso 池(7)，之後打開 V13 排空。關閉 V12 和 V13。使用去離子水重複。
11. 在注射器中重新加入漂白劑溶液。
12. 在 Exerciser（執行）選項的 Valves（閥）窗口中，打開 V64，然後推動注射器將漂白劑溶液注入網狀紅血球箱(7)，之後打開 V65 排空。關閉 V64 和 V65。使用去離子水重複此過程。

13. 將氣壓管(10)從 UFC (11)側邊斷開，將檢體管末端放入燒杯中以接取反沖流通池時的液體。
14. 在注射器中重新加入漂白劑溶液。
15. 輕推清潔用注射器的推筒，令漂白劑溶液流經紅血球流通池(2)進行沖洗。使用去離子水重複此過程。
16. 將氣壓管(10)接回 UFC (11)一側。
17. 在注射器中重新加入漂白劑溶液。
18. 在 Exerciser（執行）選項的 Valves（閥）窗口中，打開 V20 和 V21，然後推動注射器令漂白劑溶液流經氣壓通道至 VSC 池。使用去離子水重複此過程，然後關閉 V20 和 V21。
19. 將注射器(4)從白色接頭上取下。
20. 將管重新連接到 V23 (3)的接頭上。
21. 選擇 Analyzer Status（分析儀狀態）選項退出 Exerciser（執行）。
22. 打開 **Hydraulic Functions（清洗功能）**選項，然後執行 System Wash（系統清洗）周期。
23. 測試品管品驗證系統性能。

修理與更換

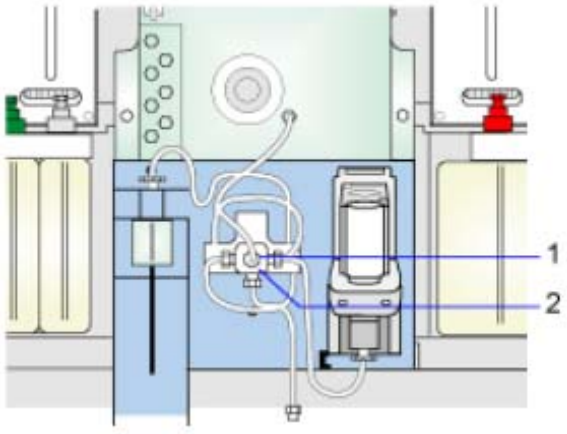
更換凝塊過濾器

所需物品：

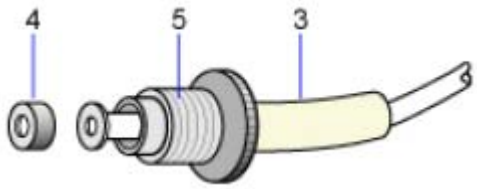
- 擦鏡紙
- 更換凝塊過濾器，PN 113-3719-01

時間：更換－5 分鐘
檢查－5 分鐘

分析儀模式：待機



1. 從選擇器閥(2)的前端取下接頭與管裝置(1)。



2. 輕輕推動硅膠套(3)，將凝塊過濾器(4)從過濾器適配器接頭(5)上脫開。
3. 目測檢查過濾器適配器接頭和選擇器裝置的輸入端口上是否有污垢或小碎屑。
4. 如果發現碎屑，用擦鏡紙醮水將其擦除。
5. 用水打濕新凝塊過濾器，並將其放入過濾器適配器接頭中。過濾器的朝向並不重要。
6. 將過濾器適配器接頭與選擇器閥重新連接。用手擰緊。

 重要訊息

 要非常小心，避免接頭方向錯誤。否則會導致閥受損，使正常操作無法進行。
7. 運行一個檢體，目測檢查選擇器閥與 UFC 裝置之間的檢體管中是否有氣泡存在。
8. 檢查吸取率。
9. 如果出現氣泡，檢查過濾器適配器接頭是否正確擰上並用手緊固，然後重複步驟 7。
 如果仍有氣泡出現，斷開過濾器適配器接頭並檢查接頭和端口中是否有污垢或碎屑。
 如果氣泡仍持續出現，請致電 Siemens 技術支持人員。

更換隔膜泵

時間：更換－5 分鐘
　　檢查－15 分鐘

所需物品：

1　DP1 - PEROX 鞘液

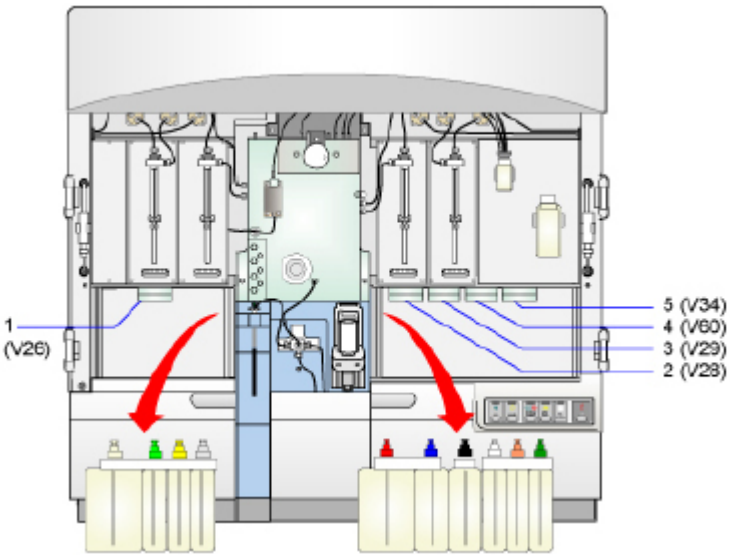
2　DP2 - 鞘液／沖洗液

3　DP3 - 鞘液／沖洗液

4　DP4 - 洗液
PN 067-B294-04

5　DP5 - 鞘液／沖洗液
PN 06-B294-01

分析儀模式：關機



取下瓶子以拿取隔膜泵

1. 從更換隔膜泵的一側將試劑瓶取下。
2. 將泵向前拉動直至其從鎖孔插槽脫出。
3. 取下 3 根關聯管，然後將其連接到新泵上。
4. 將泵上端凸起的螺栓插入鎖孔，並將泵推回固定。
5. 更換試劑瓶。
6. 檢查
 - ► 對於所有替換的泵一抽吸試劑管並檢查是否存在泄漏。
 - ► 如果更換了 DP1，運行兩次鹽水標本。在 Operations（操作）菜單中，選擇 Startup（啓動）選項。選擇 Refresh（刷新），並驗證 WBC 本底計數是否小於等於 0.1（1000 個細胞／µL）。如果更換了 DP4，進行系統沖洗，並驗證反應池中是否按其正常清洗級別注入了清洗溶液。
 - ► 如果更換了 DP5，運行兩次鹽水標本。在 Operations（操作）菜單中，選擇 Startup（啓動）選項。選擇 Refresh（刷新），並驗證血小板本底計數是否小於等於 5（1000 個細胞／µL）。

 如需要，運行更多鹽水檢體，直至兩個連續檢體獲得可接受的本底計數。如果需要 5 個以上鹽水檢體，驗證泵的安裝是否正確。
7. 測試品管品驗證分析儀性能。

更換排放裝置過濾器

如果過濾器未阻塞，但由於殘留物或污垢過重想要清潔，使用反沖過程。

時間：10 分鐘

分析儀模式：關機



警告

分析儀必須關機；否則針可能會造成人身傷害。

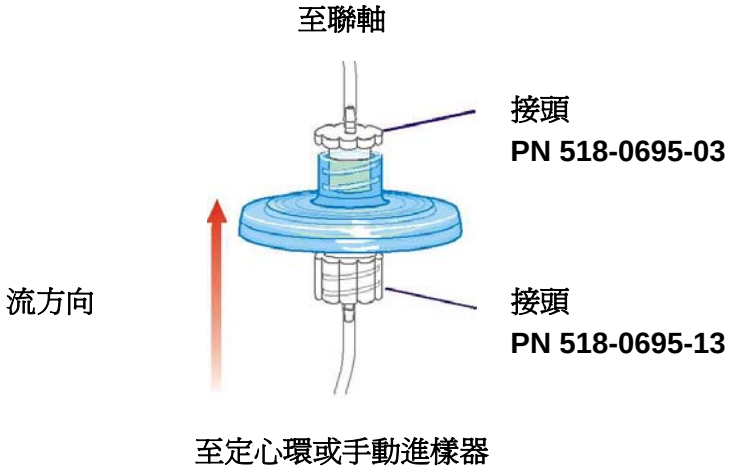


生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

1. 關閉分析儀。
2. 取下兩個接頭上的舊過濾器。丟棄舊過濾器。
3. 將新過濾器與接頭連接並用手擰緊，確保其密封良好。
4. 打開分析儀，以手動和自動進樣器模式運行檢體。檢查確定有無泄漏，液體是否正常通過過濾器。確保各種管線不會妨礙自動進樣器吸取裝置的運動。



更換 Perox 止回閥

時間：安裝並檢查－15 分鐘

所需物品：止回閥，PN 556-1190-01

分析儀模式：待機

生物危害

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1. 將舊止回閥從 Perox 管上取下。
2. 將止回閥安裝到管中，令流動向朝向試劑泵、背向試劑瓶，如右圖中紅色箭頭所示。確保不損壞閥上的管套。



3. 對試劑管路進行灌注。通過目測，檢查是否正在灌注管。
4. 測試品管品。

更換前分血片或分血閥轉子

所需物品：

- ADVIA TESTpoint 質控品
- 校正品（根據需要）
- 分血閥前分血片，PN 067-0558-01
- 分血閥轉子，PN 067-0876-01
- 全血

時間：更換－5 分鐘
檢查－15 分鐘

分析儀模式：待機



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

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要取下並更換前分血片或分血閥轉子

在維護過程中，**Cleaning the Shear Valve**（清潔分血閥）

轉到**步驟 1** 將分血閥拆開。

轉到**步驟 3** 用新部件重新組裝分血閥。

要檢查分析儀性能

在 Operations（操作）菜單中，選擇 **Startup**（啓動）選項，然後驗證本底計數。

測試全血標本。

測試品管品。如果品管品未能恢復，請校正受影響的通道。

更換保險絲

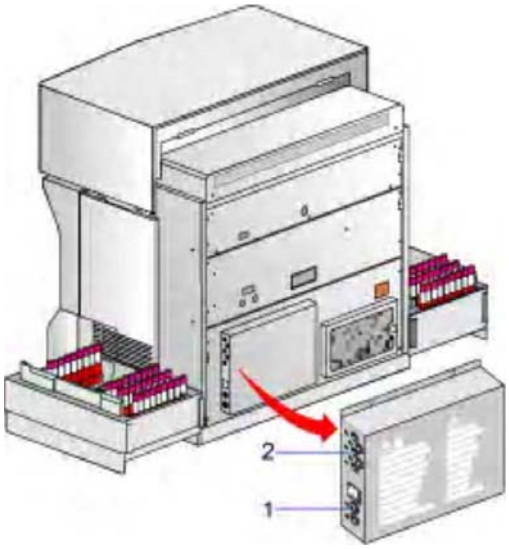
重要訊息

必須使用相同額定值的保險絲更換所有保險絲。

所需物品：平頭螺絲刀

保險絲額定值和部件號：

保險絲熔斷器			保險絲額定值	
保險絲編號	所保護設備	類型	100V 120V 系統	220V 230V 240V 系統
F1	交流輸入(L1)	3 AB	15.00A (T) 250V PN 625-0073-03	800A (T) 250V PN 625-0073-02
F2	交流輸入(L2)	3 AB	15.00A (T) 250V PN 625-0073-03	800A (T) 250V PN 625-0073-02
F3	J24 和 J25 處的計算機／顯示器	20mm	630A (T) 250V PN 625-0127-11	3.15A (T) 250V PN 625-0127-10
F4	電源 PS4 + 5V	20mm	050A (T) 250V PN 625-0127-09	025A (T) 250V PN 625-0127-07
F5	電源 PS4 + 5V Perox 燈並±15V	20mm	2.00A (T) 250V PN 625-0127-04	1.00A (T) 250V PN 625-0144-03
F6	電源 PS2 + 24V	20mm	4.00A (T) 250V PN 625-0127-05	2.00A (T) 250V PN 625-0127-04
F7	電源 PS3 + SV 並± 12V	20mm	3.15A (T) 250V PN 625-0127-10	1.60A (T) 250V PN 625-0127-06

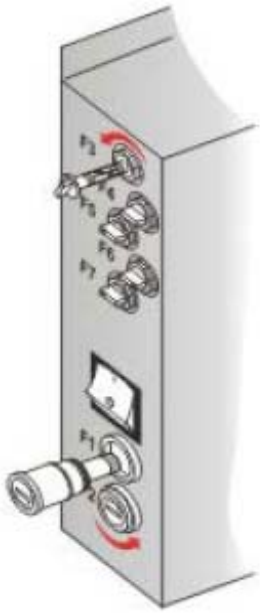


如果兩個主保險絲 **F1** 和 **F2** 任一燒斷，二者都需更換。

位置：
兩個主保險絲 **F1** 和 **F2 (1)**，保險絲 **F3** 至 **F7 (2)**

分析儀模式：Off（關機），電源插頭已拔下

要更換 20-mm 保險絲（F3 至 F7）



1. 將保險絲支架向逆時針方向打鬆開。
2. 拉出保險絲支架，然後取出燒斷的保險絲。
3. 插入新保險絲，將保險絲支架滑入，沿順時針方向將其擰緊。
4. 將電源線插頭插入，並將電源開關設置爲 **I**（開）。

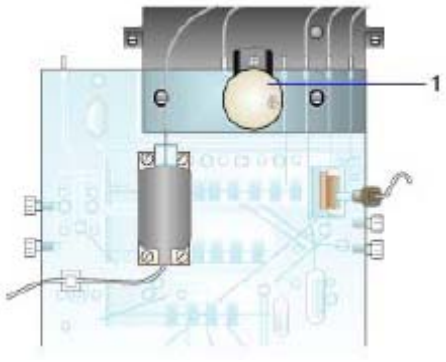
要更換主保險挫（F1 和 F2）

注意
兩根保險絲必須都更換。

1. 使用螺絲刀將保險絲蓋帽沿逆時針方向擰開。
2. 取下保險絲蓋帽並更換保險絲。
3. 安裝保險絲蓋帽並沿順時針方向將其擰緊。
4. 將電源線插頭插入，並將電源開關設置爲 **I**（開）。

更換血紅素光度計燈泡

需更換此燈泡的情況：



- 出現 HGB - PL 錯誤。
- 燈已燒損。
- 基準值降到 2.5 伏以下。
- 無法將基準值調整到 3.0 伏與 4 伏之間。
- 排查故障的過程中指示這樣做。

要調整血紅素基準值的情況：

- 更換燈之後。
- 基準值>4.2 伏。
- 排查故障的過程中指示這樣做。

警告

避免燒損。留出足夠時間讓血紅素燈冷卻。關閉電源後至少等待 5 分鐘後再取下燈。

所需物品：

- ADVIA TESTpoint 質控品
- 校正品（根據需要）
- 血紅素光度計燈泡 PN 113-B413-01
- 1/16 英寸(1.6-mm)六角扳手
- 十字頭螺絲刀

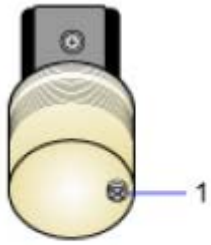
時間：更換－15 分鐘
　　檢查－25 分鐘

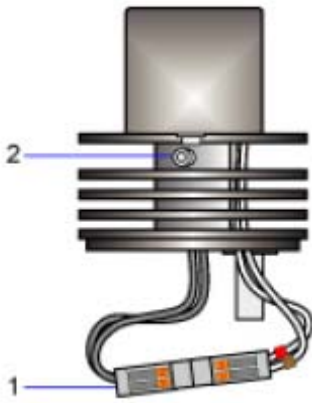
電氣警告

為避免在執行該過程時受到電擊和／或損壞儀器，請在繼續操作之前關閉分析儀的電源。

分析儀模式：關機

1. 取下固定燈適配器蓋帽的螺釘(1)，然後取下蓋帽。注意不要遺失兩個墊圈。保留硬件及蓋帽。
2. 斷開電纜(2)。
3. 使用六角扳手擰開定位螺釘(3)鬆脫舊燈，然後將其取下。
4. 將新燈盡可能深地推入外殼中，然後擰緊定位螺釘將其固定。
5. 重新連接電纜。裝回燈適配器蓋帽並用螺釘將其固定。





6. 打開分析儀的電源。檢查狀態欄中是否有與血紅素光度計基礎讀數相關的錯誤訊息。
7. 在 Operations（操作）菜單中，選擇 **Startup（啓動）**選項。選擇 **Refresh（刷新）**並檢查血紅素基準透射值(Hgb Trans)。如果基準值不可接受，將其調整力 4.1。
8. 測試品管品驗證分析儀性能。如果品管品結果不可接受，那麼重新校正血紅素通道。

更換液壓閥

共有 6 個液壓閥：3 個位於 perox 流通池下方，3 個位於 RBC/baso/retic 流通池下方。

所需物品：

- 小平頭螺絲刀
- 液壓閥，PN 067-1024-01

時間：更換－10 分鐘
　　檢查－15 分鐘

分析儀模式：關機

電氣警告

為避免在執行該過程時受到電擊和／或損壞儀器，請在繼續操作之前關閉分析儀的電源。

生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。

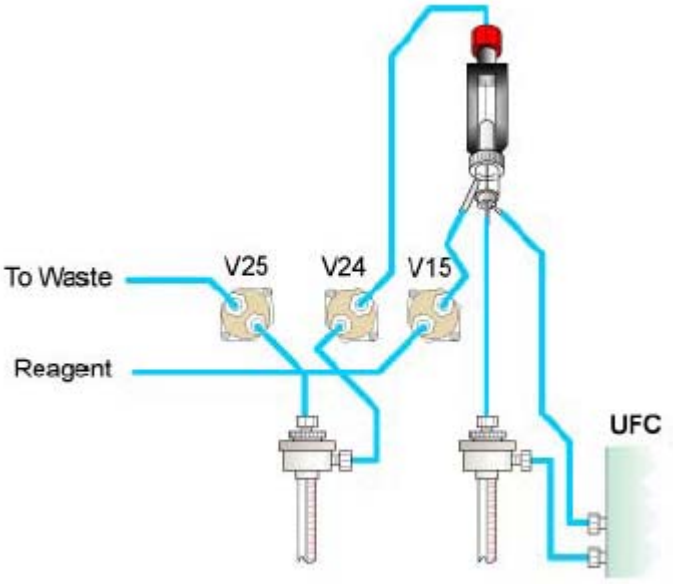
本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

1. 將管從閥接口的端口上取下，然後小心取下接頭。
2. 取下兩個安裝螺釘。向前拉動閥直至連接器露出，然後斷開電纜。
3. 將新閥裝置的電纜連接到分析儀上露出的連接器上。
4. 將電纜折起塞進開口中。使用步驟 2 中保留的兩個螺釘安裝新閥。
5. 更換接頭。確保其螺紋方向正確。用手擰緊。

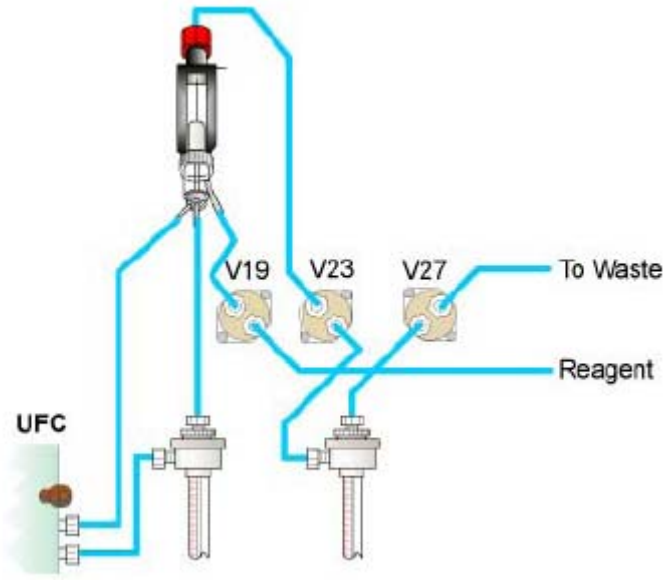
警示

不要擰得過緊，否則會導致閥或接頭受損。

6. 連接管



Perox 流通池連接



紅血球流通池連接

7. 測試品管品。檢查是否有泄漏並驗證系統性能。

更換開管進樣器探針

所需物品：

- 檢體探針裝置，PN 113-B646-01
- 解剖刀或刮鬍刀片

時間：更換－10 分鐘
檢查－15 分鐘

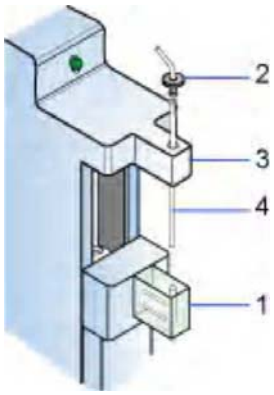
分析儀模式：Off（關機）

生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

1. 小心地將清洗模組(1)向下推，直至最低位置。
2. 逆時針旋轉螺紋接頭(2)，將其從探針座(3)上取下。
3. 小心地向上滑動探針(4)將其從座中取出。
4. 將探針丟棄。
5. 取下替換探針上的塑料圈和墊片並丟棄。將探針小心地經過探針座(3)開口插入清洗模組的開口中。



裝回螺紋接頭並沿順時針方向用手擰緊

6. 檢查檢體探針的長度，必要時進行調整。（有關說明，請參見第 5-4 頁。）
7. 開始再次運行患者檢體前，按以下步驟檢查操作：
 a. 運行若干鹽水標本以驗證是否存在泄漏，然後測試全血標本來驗證吸取後探針是否已正確清洗。
 b. 目測檢查開管檢體管中是否有氣泡。
 c. 測試足夠多的品管品來驗證分析儀性能。如果品管品結果不可接受，檢查是否已正確安裝探針。如果未發現問題，重新校正受影響通道。

更換 Perox 燈

警告

為阻止玻璃碎片傷及眼睛，處理鹵鎢燈時底佩戴防護鏡。

為避免嚴重燒傷，應留出足夠時間讓燈冷卻。關閉分析儀後至少等待 10 分鐘。

警示

燈上的指痕會導致燈的性能嚴重降低。

不要用手指觸摸燈。

所需物品：替換燈，PN-065-B075-01

時間：更換－20 分鐘
調整及檢查－20 分鐘

分析儀模式：Off（關機），至少等待 10 分鐘。

電氣警告

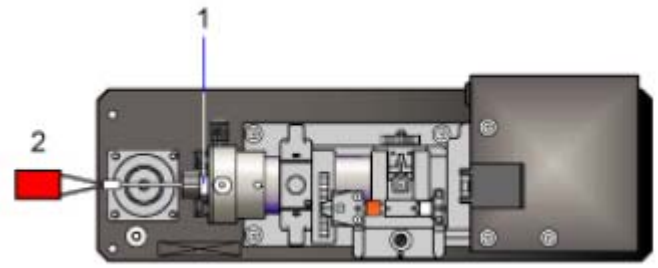
為避免在執行該過程時受到電擊和／或損壞儀器，請在繼續操作之前關閉分析儀的電源。

要更換 perox 燈(1)

重要訊息

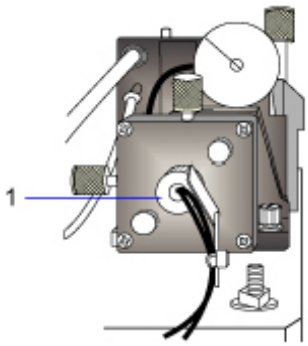
取下燈前要確保已關閉電源。

1. 擠壓 perox 光學器件裝置背部的紅色燈電源連接器(2)的兩端並將其拉出斷開。



分析儀前端

2. 取下連接電源線(2)的固定蓋帽。將燈裝置小心地從光學器件燈外殼中拉出。燈裝置包括燈、電源線以及固定蓋帽。將整個裝置丟棄。



PEROX 光學器件裝置背部視圖

3. 插入替換燈裝置。

警示

不要觸碰玻璃燈泡。必要情況下用擦鏡紙和甲醇進行清潔。更換固定蓋帽，然後連接紅色電源連接器。

5. 打開分析儀，將燈校正使其輸出最大化。（有關說明，請參見第 5-5 頁。）

更換 perox 流通池

時間：安裝－15 分鐘
　　檢查－15 分鐘

分析儀模式：Standby（待機）

生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

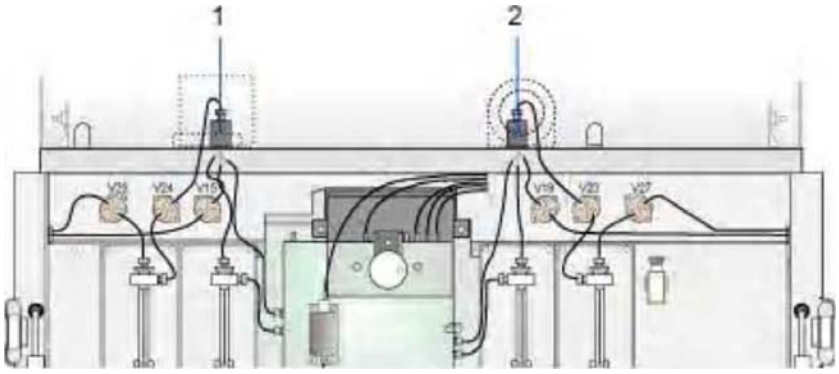
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重要訊息

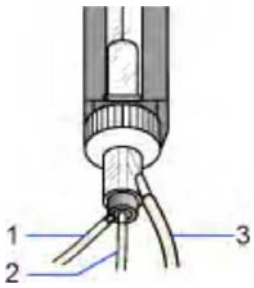
必須爲此過程提供檢查範圍。除非接受這校正與聚焦流通池的培訓，否則不要將其取下。

要取下流通池

1. 確保分析儀處於 Standby（待機）模式。
2. 打開光學器件蓋板。Perox 流通池在左側。
 Perox 流通池(1)，紅血球流通池(2)

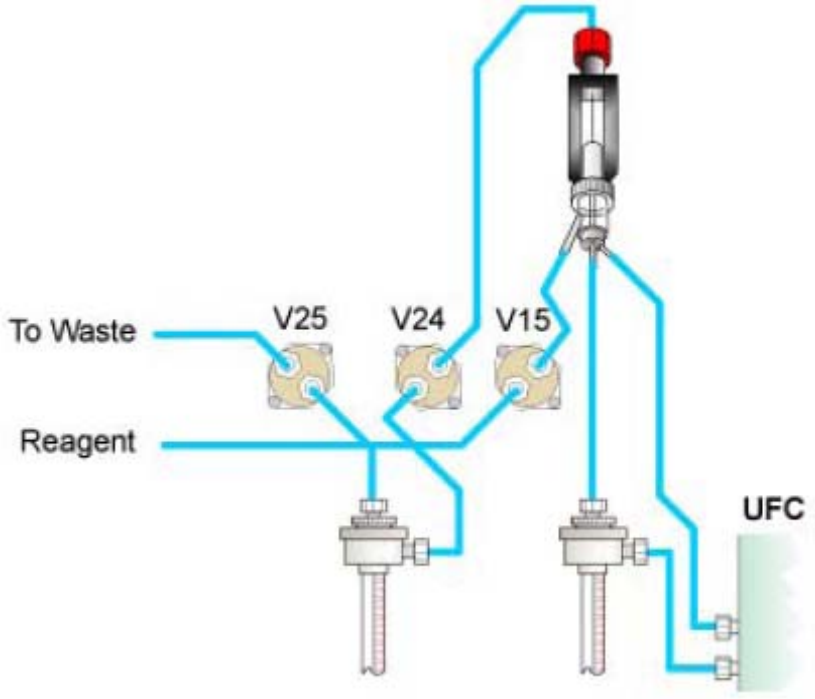


3. 將氣壓管(1)、檢體流輸入管(2)及鞘液輸入管(3)從 CFM 斷開。讓這些管自由垂下。



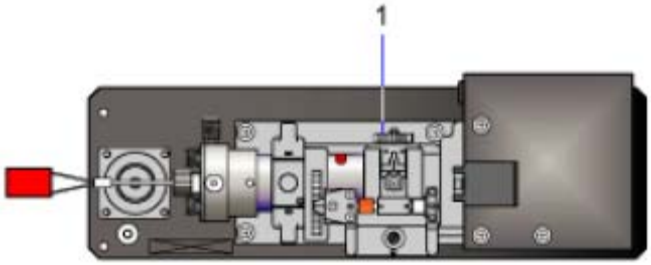
1 鞘液接頭
2 檢體接頭
3 氣壓接頭

4. 找到液壓閥＃24，將閥右上端的螺紋接頭打開。

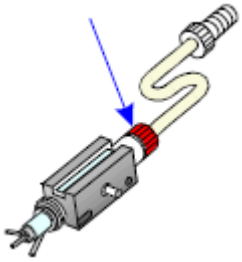


5. 擰開位於流通池調整裝置右側的釋放旋鈕，將流通池取下。

流通池釋放旋鈕(1) →分析儀前端



6. 抓住流通池頂部的紅色螺紋接頭，將流通池輕輕提起，從光學器件裝置中取出。





警示

為避免在流通池的玻璃窗口上留下指痕，應始終拿握流通池的金屬片部分。

要安裝流通池

1. 抓住流通池上的紅色螺紋接頭，將其輕輕放入光學器件裝置。
2. 擰緊釋放旋鈕，將流通池鎖定入位。
3. 將液壓管重新連接到 CFM。將流通池管裝置接頭與其相應液壓閥 V24 重新連接。手動將連接處擰緊以防止泄漏。

重要訊息

爲避免患者數據錯誤，確保每個液壓管都連接到正確的 CFM 接頭上。

要檢查分析儀性能

1. 將分析儀置爲 Ready to Run（準備運行）模式，然後運行一個鹽水檢體。
2. 檢查流通池連接是否有泄漏，並選擇 Startup（啓動）選項驗證鹽水本底。
3. 在 Procedures（過程）菜單中，選擇 **Align optics（校正光學器件）**選項。
4. 選擇 Info（訊息）按鈕查看幫助內容。
5. 在 Logs（日誌）菜單中，選擇 **Cal/Gain Logs（Cal/Gain 日誌）**並檢查 Gain 系數。必要時進行調整。
6. 測試一份全血標本，然後測試品管品來驗證分析儀性能。
7. 如果品管品結果對實驗室來說可以接受，無需採取其他措施，可恢復正常操作。

更換 RBC/Baso/Retic 流通池

在取下 RBC/Baso/Retic 流通池前，請閱讀所有激光危害預防措施。

時間：安裝－15 分鐘
　　檢查－15 分鐘

分析儀模式：Standby（待機）



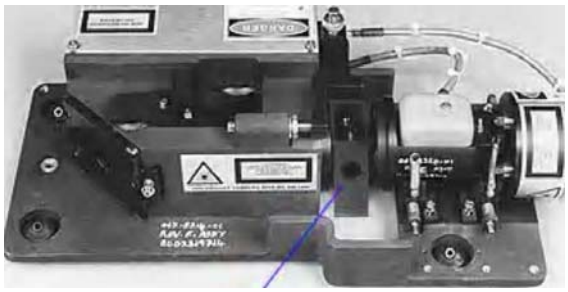
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對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

警告

為避免因激光輻射造成受傷，不要取下激光防護屏。如果激光光學器件裝置上激光防護屏未就位，不得取下流通池。



激光防護屏

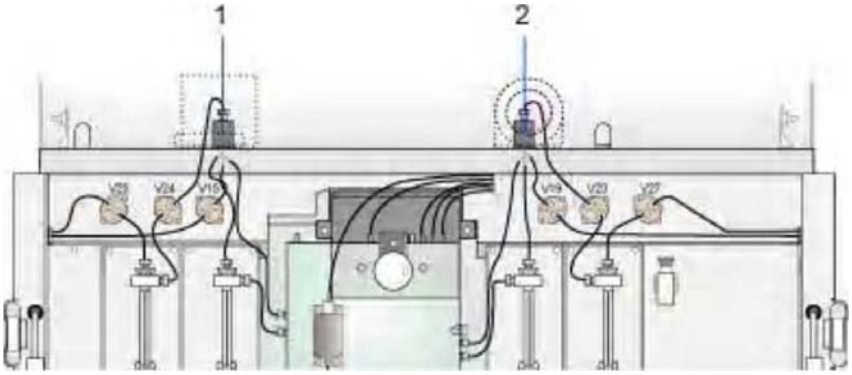
不要取下！

有關激光的警告

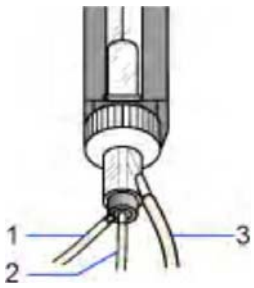
為避免傷害眼睛，切勿直視激光光束或明亮表面反射的激光光束。必須嚴格遵循所有現場維修過程。只有經過 Siemens 培訓的現場維修人員可以執行與激光裝置相關的過程。

有關更詳細的安全訊息和激光規格，請參考安全訊息、防止受到激光傷害。

1. 確保分析儀處於 Standby（待機）模式。
2. 打開光學器件裝置蓋板。紅血球流通池在左側。
 Perox 流通池(1)，紅血球流通池(2)

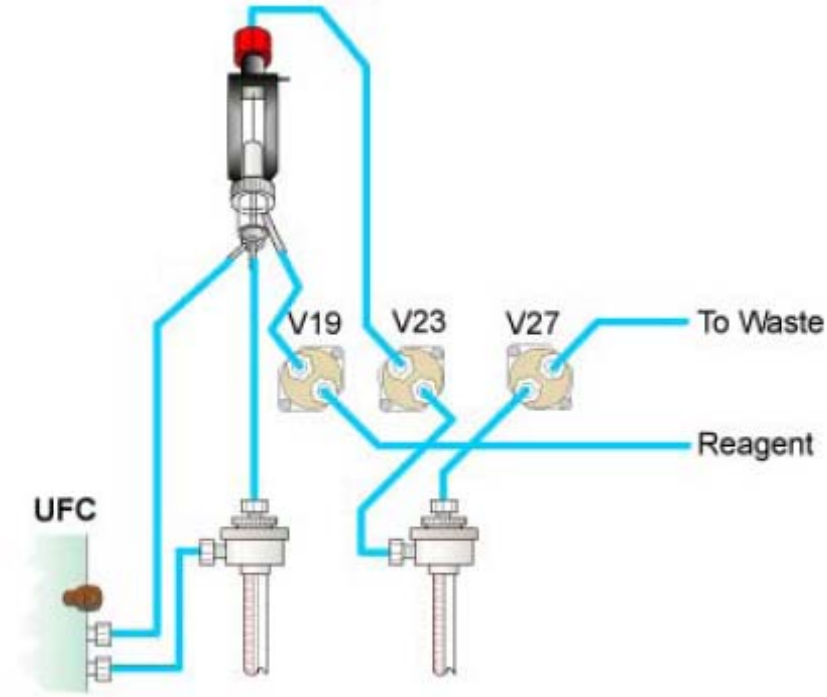


3. 將氣壓管(1)、檢體流輸入管(2)及鞘液輸入管(3)從 CFM 斷開。讓這些管自由垂下。

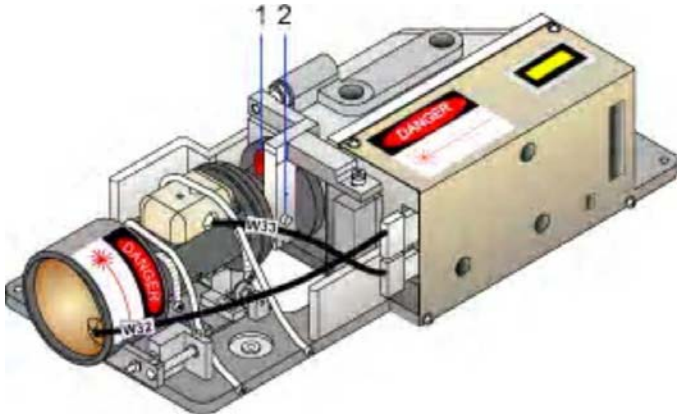


1 氣壓接頭
2 檢體接頭
3 鞘液接頭

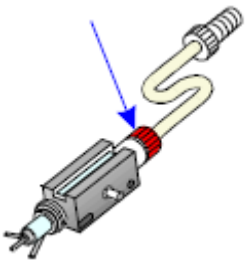
4. 找到液壓閥＃23 。從閥左上端打下螺紋接頭。



5. 擰開緊固型流通池釋放螺釘，然後取下流通池。
流通池(1)，流通池釋放螺釘(2)



6. 抓住流通池上的紅色螺紋接頭，將流通池提起從光學器件裝置中取出。



警示

為避免在流通池的玻璃窗口上留下指痕，應始終拿握流通池的金屬片部分。

要安裝流通池

1. 抓住流通池上的紅色螺紋接頭，將其輕輕放入光學器件裝置。
2. 將流通池放置到定位銷上。確保其固定在兩個定位銷上。流通池角度應爲 4°擰緊緊固型流通池釋放螺釘將流通池鎖定入位。
3. 將液壓管重新連接到 CFM。將流通池管裝置接頭與其相應液壓閥 V234 重新連接。用手將連接處擰緊到足以阻止泄漏。

重要訊息

爲避免患者數據錯誤，確保每個液壓管都連接到正確的 CFM 接頭上。

要檢查分析儀性能

1. 將分析儀置爲 Ready to Run（準備運行）模式，然後運行一個鹽水檢體。
2. 檢查流通池連接是否有泄漏，並選擇 Startup（啓動）選項驗證鹽水本底。
3. 在 Procedures（過程）菜單中，選擇 **Align optics（校正光學器件）**選項。
4. 選擇 Info（訊息）按鈕查看幫助內容。
5. 在 Logs（日誌）菜單中，選擇 **Cal/Gain Logs（Cal/Gain 日誌）**並檢查 Gain 系數。必要時進行調整。
6. 測試一份全血標本，然後測試品管品來驗證分析儀性能。
7. 如果品管品結果對實驗室來說可以接受，無需採取其他措施，可恢復正常操作。

更換注射器

要取下並更換注射器之一，請遵循 Maintenance（維護）部分的說明，更換注射器推筒。

更換真空泵過濾器（通氣過濾器）

某些液體如果進入真空泵的話會對其造成損傷，真空過濾器會將其阻擋住。如果此過濾器充滿液體，要將其更換。

所需物品：

- 大平頭螺絲刀
- 紙巾
- 通氣過濾器
 PN 518-3146-01

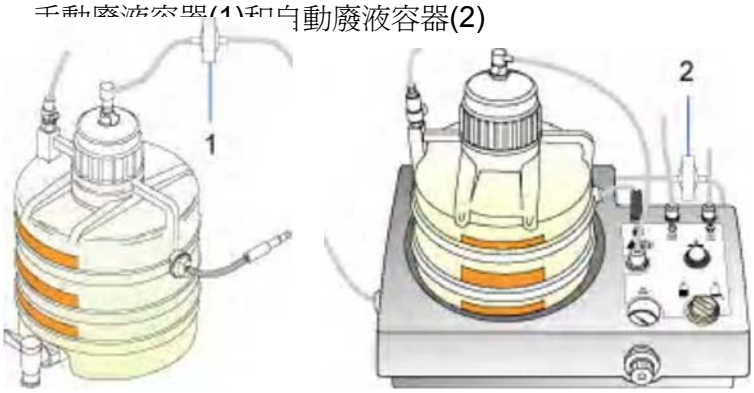
時間：
更換－10 分鐘
檢查－10 分鐘

分析儀模式：Off（關機）

每個過濾器上都印刻有 FLUID SIDE（液體端）字樣。

過濾器位置：

手動廢液容器(1)和自動廢液容器(2)



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

要更換過濾器

1. 將紙巾墊在過濾器下方。
2. 將過濾器斷開並丟棄。
3. 安裝新過濾器。

重要訊息

過濾器的方向很重要。在過濾器上找到 FLUID SIDE（液體端）字樣，並按上圖所示放置管中過濾器的朝向。

4. 將紙巾丟棄。

5. 打開分析儀的電源。



警示

為避免嚴重損壞分析儀，在通氣過濾器未就位的情況下絕不能打開分析儀的電源。

6. 要進行手動廢液處理，在 Utilities（工具）菜單中，選擇 **Analyzer Status（分析儀狀態）**選項。在 Vacuum and Pressure（真空與壓力）區，檢查 20 英寸汞柱讀數是否在 19 與 21 之間。如需要，調整 20 英寸汞柱真空調節器旋鈕。

重要訊息

必須只向上或按順時針方向轉動旋鈕來達到所有氣動設置。如果有讀數高於目標值，將旋鈕向回轉，讓分析儀進行配平。分析儀每 5 秒顯示一個新讀數。向上調整來對值進行糾正。

對於帶有自動廢液處理功能的系統，運要驗證 20 磅／平方英寸讀數。必要時調整壓力調節器旋鈕。

7. 如果讀數無法達到 19 至 21，檢查連接到過濾器的管是否固定好。如仍有困誰，請致電 Siemens 技術支持人員。

更換清洗模組

時間：更換－5 分鐘
檢查－15 分鐘

分析儀模式：Standby（待機）



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，應按照美國臨床實驗室標準化委員會(NCCLS) M29-A 號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

1. 取下檢體探針。(有關說明，請參見第 5-36 頁。)
2. 等待約 2 分鐘，直至清洗模組解除真空狀態。輕輕按下吸液板，清洗模組裝置下降約 1 英寸(25.4 mm)。
3. 用一只手托住吸液板。用另一只手的手指抓住清洗模組的頂部和底部，將模組輕輕下推，直至其滑下約 1/4 英寸(6.5 mm)。用板裝置上的開口校正清洗模組上的小突片。將模組輕輕平直拔出取下。
4. 用膠帶標記管（頂部是沖洗管線，底部是真空管線)，然後將管線都取下。注意不要將管掉落到吸液板裝置後面。必要時，在裝置外用止血鉗來夾持管。
5. 將管線連接到新模組。
6. 通過將模組上的小突片對準相應插槽，將模組安裝到吸取裝置上。將模組推入吸取裝置內，並將其輕輕向上滑動直至咔嗒一下入位。注意在安裝過程中不要擠壓清洗管或真空管。
7. 檢查探針的長度。(有關說明，請參見第 5-4 頁。)
8. 運行若干鹽水標本以驗證檢體管是否泄漏或有氣泡。
9. 測試全血標本來驗證吸取後探針是否已正確清洗並乾燥。
10. 檢測品管品驗證分析儀性能。

故障排除技巧

自動進樣器故障排除技巧

當分析儀電源關閉然後又重新打開後，就會顯示 Eject rack（彈出樣品架）或 Rack in sampler （樣品架進入進樣器）狀態欄錯誤消息。

爲避免自動進樣器錯誤，要等到顯示下面兩條狀態欄消息後，才能重新打開電源：

Communications Error with Analyzer（與分析儀的通信錯誤）

Analyzer/Computer Not Connected（分析儀／計算機未連接）

定心環上的檢體接頭有滲漏。

用手將接頭擰緊約 1 1/2 周，然後使用 7/32 英寸(6-mm)開口扳手將接頭再擰緊 1/8 周。

啓動自動進樣器時有時會出現"Input queue gate open"（輸入隊列門打開）錯誤消息。

當樣品架在入架倉區內等待時，有時會出現這個錯誤消息。將樣品架向後移至托盤最前面的位置，再次啓動自動進樣器。

無法找到視頻

"Cannot find the videos_op\videos_op.hlp Help file. Check to see that the file exists on your disk. If it doesn't, you need to reinstall it."（無法找到 videos_op\videos_op.hlp 幫助文件。檢查磁盤中是否存在該文件。如果沒有，需要重新安裝。）

如果試圖觀看視頻時出現這一訊息且您近期安裝了 zip 驅動器，可能是分配給您的 CD-ROM 驅動器的字母已更改。

重新安裝操作者指南。安裝進程會重置視頻的正確路徑。

檢查排放裝置過濾器是否阻塞

請參見第 5 頁 28 的”更換排放裝置過濾器”。

壓縮機無法啓動



如果太快地關閉再重新啓動分析儀，壓縮機可能無法啓動，導致系統初始化失敗。這是由於廢液容器仍然處於真空狀態導致的。操作者必須手動給廢液容器通氣。

要手動給任一廢液容器（手動廢液容器或自動廢液容器）通氣，斷開廢液容器真空管(1)，等真空狀態解除後再重新接上。

數據管理器與 LIS

在計算機主機上，如何區分品管品？

在發送給主機的 SID 中，C 之後的頭兩個數字標識品管品如下：

品管品類型	第一位數字	第二位數字
CBC/DIFF	**1**	**1、4 或 7＝低**
		2、5 或 8＝正常
		3、6 或 9＝高
RETIC	**2**	**1、3 或 5＝低**
		2、4 或 6＝高

備份 10,000 個 All Complete（全部完成）檢體需要多少張 3.5 軟碟？

備份大約需要 14 張軟碟，1.5 個小時。爲節約時間，應每天進行一次 All Complete（全部完成）備份。在一次 All Complete（全部完成）過程中，系統將只備份最近一次備份後增加的記錄。系統在將滿之時會發出警告。檢體數達到 9800 個時會出現默認警告，但可以在 Customer Parameters（客戶參數）中進行修改。由於數據庫中記錄超過 10,000 個時系統無法操作，一旦數據庫中記錄接近 9000 個，就應該每天清除 500 或 1000 個最早的記錄。這樣就爲次日的檢體留出空間。在 Customer Parameters（客戶參數）中，還可以選擇設置 All Complete（全部完成）文件大小來觸發清除操作－在執行 End of Day（工作日結束）流程時自動清除記錄。

爲什麼當計算機主機電纜從我的 PC 斷開時，Sample Cont. Panel（檢體計數面板）上的 LIS 鏈接指示燈仍保持爲綠色？

雙向協議通信鏈接是時滯的。斷開電纜後，需要等 30 至 60 秒 LIS 鏈接指示燈才會變紅。但是，如果在這段時間過去之前試圖向計算機主機發送訊息，指示燈會立即變紅。

如果您的系統設置爲單向協議，LIS 鏈接指示燈則以不同方式工作。打開主機通信後，在發送第一個檢體之前，指示燈都會保持爲紅色。只要發送這檢體，指示燈就會變綠，而且保持綠色不變，即便計算機主機電纜從您的 PC 上斷開後也是如此。

觀看視頻時沒有聲音

如果觀看視頻時沒有聲音，在監視器上調整聲音。請參考所使用監視器隨附手冊中的說明。

動畫不伴有聲音。

Perox 腔室

PEROX 3 試劑在 PEROX 2 試劑瓶變空之前用完。

Perox 反應池溢流

- 檢查 Perox 反應池蓋是否阻塞。使用鑽頭或迴紋針清除所有阻塞物。
- 檢查 Perox 溢流管是否阻塞或卷曲。
- 確保管的兩端未接觸溢流瓶底，也沒有浸入液體中。

注意

如果溢流瓶蓋帽上的開口不夠大而且擠壓試管，將橡膠蓋帽從外緣向內部開口割開，將試管所受壓力釋放一些。

警示

形態學警示 3

總結 3
ANISOCYTOSIS（紅血球大小不均，ANISO） 4
ATYPICAL LYMPHOCYTES（異形淋巴細胞，ATYP） 5
BLASTS（原始細胞，BLASTS） 6
HGB CONCENTRATION VARIANCE（HGB 濃度差異，HCVAR） 8
HYPERCHROMIA（著色過度，HYPER） 8
HYPOCHROMIA（低血紅素濃度，HYPO） 9
IMMATURE GRANULOCYTES（未成熟粒細胞，IG） 10
LARGE PLATELETS（大血小板，LPLT） 11
LEFT SHIFT（核左移，LS） 12
MACROCYTOSIS（大紅血球，MACRO） 13
MICROCYTOSIS（小紅血球，MICRO） 14
MYELOPEROXIDASE DEFICIENCY（髓過氧物酶缺陷症，MPO-D，MO） . 15
NUCLEATED RED BLOOD CELLS（有核紅血球，NRBC） 16
PLATELET CLUMPS（血小板凝集，PLT-CLM，NW） 17
RBC FRAGMENTS（紅血球碎片，RBCF） 18
RBC GHOSTS（影紅血球，RBCG） 19

檢體／系統警示 20

總結 20
BASO COUNT SUSPECT（疑似嗜鹼性粒細胞計數，B-SUSP，BC） 24
BASO IRREGULAR FLOW RATE（嗜鹼性粒細胞流速異常，BIFR，BR） ... 25
BASO NOISE（嗜鹼性粒細胞噪音，B-NO，NB） 26
BASO NO VALLEY（BASO 無波谷，B-NV，VB） 27
BASOSATURATION（嗜鹼性粒細胞飽和，B-SAT，BS） 28
BASO TEMPERATURE OUT OF RANGE（嗜鹼性粒細胞溫度超出範圍，BTO，TB） 29
COMPARISON ERROR MCHC/CHCM（比較錯誤 MCHC/CHCM，CHCMCE，CC） 30
COMPARISON ERROR WBCB/WBCP（比較錯誤 WBCB/WBCP，WBC-CE，WC） 31
HGB IRREGULAR FLOW RATE（血紅素流速異常，HGBIFR，HR） 31
HGB POWER LOW（血紅素能量低，HGB-PL，PH） 32
LASER POWER LOW（激光能量低，LAS-PL，PL） 32
NO PEROX NRBC/LYMPH VALLEY（無 PEROX NRBC／淋巴細胞谷，NRPXNV，NV） 33
PEROX IRREGULAR FLOW RATE (PEROX 流速異常，PXIFR，XR） 34
PEROX NO VALLEY（PEROX 無波谷，PX-NV，VX） 34
PEROX NOISE（PEROX 噪音，PX-NO，NX） 36
PEROX POWER LOW（PEROX 能量低，PX-PL，PX） 37
PEROX 飽和（PEROX 飽和，PX-SAT，XS） 37
PEROX TEMPERATURE OUT OF RANGE（PEROX 溫度超出範圍，PXTO，TX） 39
PLATELET NOISE（血小板噪音，PLT-NO，NT） 39
PLATELET ORIGIN NOISE（血小板源的噪音，PLTORN，OT） 41
RBC IRREGULAR FLOW RATE（紅血球流速異常，RBCIFR，RR） 42

RETIC - PLT INTERFERENCE/ERROR（網狀紅血球－血小板干擾／錯誤，RTCINT，CT）.....43
RETIC ABSORPTION DISTRIBUTION ABNORMAL（網狀紅血球吸收分布異常，RTCADA，CA）.....43
RETIC ABSORPTION FLATNESS（網狀紅血球吸收平直度，RTC-FL，RF）..44
RETIC FIT SUSPECT（疑似網狀紅血球擬合，RTC-FS，FC）.....45
RETIC IRREGULAR FLOW RATE（網狀紅血球流速異常，RTCIFR，CR）.46
RETIC NOISE ORIGIN（網狀紅血球噪音源，RTC-NO，NO）.....47
RETIC RBC COUNT LOW（網狀紅血球 RBC 計數低，RTC-L，CL）.....48
RETIC SATURATION（網狀紅血球飽和，RTCSAT，CS）.....49
RETIC SLOPE ERROR（網狀紅血球斜率錯誤，RTC-SE，SE）.....50
SUSPECT CELLULAR INTERFERENCE（可疑細胞干擾，NRCELL，NC）...50
SUSPECT LARGE PLT INTERFERENCE（可疑大血小板干擾，NRLPLT，NP）.....51
SUSPECT LIPID INTERFERENCE（可疑脂類干擾，NR-LPD，NL）.....52
WBC SUBSTITUTION（WBC 替換，WBCSUB，WS）.....52

形態學警示

總結

通過結合使用形態學和定量警示（高和低），實驗室工作人員會對可疑檢體異常保持警覺。ADVIA 2120/2120i 形態學警示源自一系列複雜的算法。這些算法基於對異常狀況出現的周圍情況的識別。

有關結果舍入的說明，請參見本手冊中”法規訊息部分”中的”結果計算”內容。

分析儀不會將異常細胞一一列出。

盡管在檢測與異常細胞出現相符的狀態方面敏感度和特異度都很好，但 ADVIA 2120/2120i 分析儀所產生的測試結果僅用於實驗室用途。只要發現形態學或定量警示，實驗室就必須對結果進行驗證，並根據制定的標準操作規程採取相應措施，然後才能報告患者結果。

形態學警示顯示在 Run Screen（運行屏幕）和 Review/Edit（檢查／編輯）選項中。

下表標明因每個測試選擇而觸發的形態學警示。圓括號中的二位字母代碼顯示在 Run Screen（運行屏幕）中。

警示	觸發標準	CBC	CBC/ DIFF	CBC/DIFF/ RETIC	CBC/ RETIC	RETIC
ANISO	RDW ≥ 16%	√	√	√	√	
ATYP	%LUC ≥ 4.5 且 % LUC ≥ (%BLAST + 1.5)		√	√		
BLASTS	1. % BLASTS 1.5%至 5.0%且%LUC ≥ 4.5%或		√	√		
	2. % BLASTS>5.0% WBCB 或					
	3. % BASO + % BASO Susp + % BASO Sat ≥ 10%					
HCVAR	HDW≥3.4 g/Dl	√	√	√	√	
HYPER	% HYPER ≥ 4%	√	√	√	√	
HYPO	% HYPO ≥ 4%	√	√	√	√	
IG	[(%NEUT + % EOS)- %PMN] ≥ 5.0%		√	√		
LPLT	%LPLT>10% PLT	√	√	√	√	

警示	觸發標準	CBC	CBC/ DIFF	CBC/DIFF/ RETIC	CBC/ RETIC	RETIC
LS	BASO d/D < 0.15 且% NEUT ≥ 30%		√	√		
MACRO	%MACRO ≥ 2.5%		√	√	√	
MICRO	%MICRO ≥ 2.5%	√	√	√	√	
MPO-D (MO)	[%PMN - %NEUT + %EOS]] ≥ 25，無 NRBC 警示且存在有效 MN-PMN 波谷(d/D ≥ 0.15)		√	√		
NRBC	1. WBCu ≥ 3000 個細胞/μL 且 %Nrbc ≥ 2.0% (# Nrbc/100wbc) 或 2. %nrbc ≥ 200 個細胞/μL		√	√		
PLT-CLM (NW)	聚集計數＞150		√	√		
RBCF	RBCF>100,000 個細胞/μL	√	√	√	√	
RBCG	RBCG>100,000 個細胞/μL	√	√	√	√	

Anisocytosis（紅血球大小不均，ANISO）

定義

如果紅血球體積(RDW)的差異大於等於 16%，Anisocytosis（紅血球大小不均）警示就會出現。紅血球分布竟度(RDW)參數，是紅血球體積直方圖的紅血球體積分布差異系數。

3 種嚴重程度的默認觸發值是：

+ RDW = 16.0%至 17.9%

+ + RDW = 18.0%至 22.0%

+ + + RDW > 22.0%

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 小紅血球性貧血
- 大紅血球性貧血
- 缺鐵性貧血，應補鐵治療
- 輸血

系統相關

1. 檢查 RBC 試劑
2. 檢查 RBC 通道液路
3. 檢查 RBC Gains
4. 檢查激光流通池校正

Atypical Lymphocytes（異形淋巴細包，ATYP）

定義

疑有異形淋巴細胞出現。

Perox 細胞直方圖上的%LUC 值升高，可能是由於出現過氧化物酶陽性的大型異性淋巴細胞、原始細胞和／或其它大型異常細胞造成的。大型淋巴細胞定義爲體積大於曲型淋巴細胞群的淋巴細胞群的淋巴細胞。

在 Baso 細胞直方圖中，原始細胞是獨立分類的，從升高的%LUC 值中減去%BLASTS 後，剩餘的百分比就是異性淋巴細胞造成。

如果%LUC 大於等於 4.5，且%LUC 比%BLAST 大 1.5 以上，這個警示就會出現。

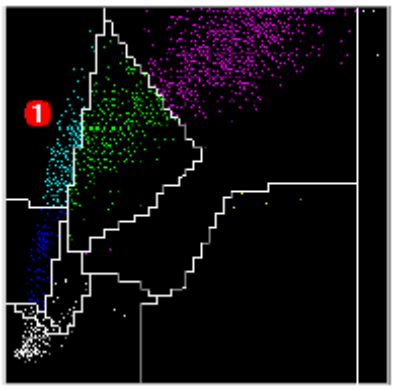
3 種嚴重程度的默認觸發值是：

+ %LUC = 4.5%至 7.4%

+ + %LUC = 7.5%至 10.0%

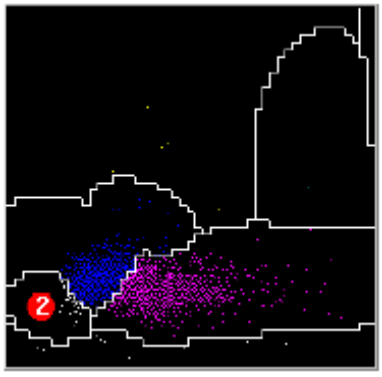
+ + + %LUC > 10.0%

Perox 細胞直方圖(ATPY +++)



1 LUC 區

Baso 細胞直方圖



2 BLASTS 區

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 病毒感染
- 淋巴細胞增生性疾病
- RBC 難溶紅血球

系統相關

1. 檢查 perox 試劑。
2. 檢查鞘液／沖洗液的供應。
3. 檢查 perox 通道液路和檢體的供應。
4. 檢查 perox 反應池溫度。
5. 檢查 perox 流通池校正。
6. 檢查 perox Gains。

Blasts（原始細胞，BLASTS）

定義

疑有原始細胞出現。在 Baso 細胞直方圖上的 Blasts 區和 Perox 細胞直方圖上的 LUC 區中檢測到原始細胞。

這個警示的觸發條件是：

- % BLASTS 1.5%至 5.05 且%LUC ≥ 4.5%或
- % BLASTS 大於總 WBCB 的 5.0%，或
- % BASO + % BASO Susp + % BASO Sat 渣 10 %

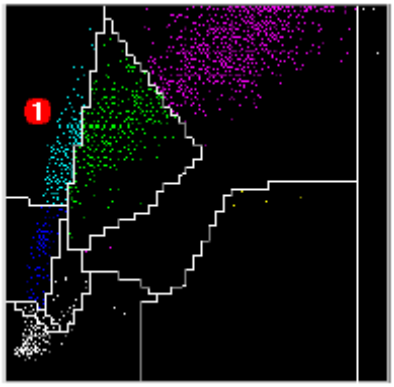
3 種嚴重程度的默認觸發值是：

+ % BLASTS 1.5%至 5.0%

+ + % BLASTS > 5.0%至 10.0%

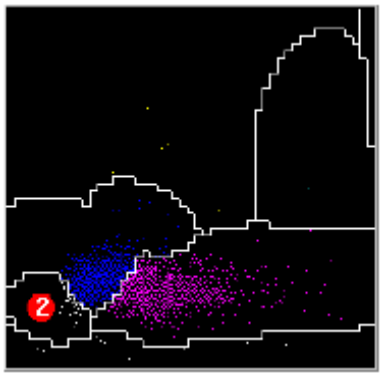
+ + + % BLASTS > 10.0%

Perox 細胞直方圖



1 LUC 區

Baso 細胞直方圖



2 BLASTS 區

% BLASTS 值僅供警示及實驗室用途。% BLASTS 值不作爲患者結果報告。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 急性白血病
- 慢性白血病
- 淋巴瘤
- 骨髓纖維化
- 過量原始細胞頑固性貧血 (RAEB)
- 新生兒檢體

系統相關

1. 檢查 perox 和 baso 試劑。
2. 檢查鞘液沖洗液的供應。
3. 檢查 perox 通道液路。
4. 檢查 baso 通道液路。
5. 檢查 perox 流通池校正。
6. 檢查激光流通池校正。
7. 檢查壓力和真空讀數。
8. 檢查 baso 和 perox gains。

HGB Concentration Variance（HGB 濃度差異，HCVAR）

定義

如果細胞血紅素濃度的差異(HDW)大於等於 3.4 g/dL，
Hgb Concentration Variance（血紅素濃度差異）警示就會出現。

血紅素分布寬度(HDW)參數，是 RBC HC 直方圖上細胞血紅素濃度分布的標準差。

3 種嚴重程度的默認觸發值是：

+ HDW% = 3.4 g/dL 至 3.9 g/dL

+ + HDW% = 4.0 g/dL 至 4.6 9/dL

+ + + HDW% > 4.6 g/dL

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 鐮狀細胞貧血
- 缺鐵性貧血
- 溶血性貧血
- 輸血

系統相關

1. 檢查 RBC 試劑。
2. 檢查 RBC 通道液路。
3. 檢查 RBC Gains。
4. 檢查激光流通池校正。

Hyperchromia（著色過度，HYPER）

定義

如果細胞血紅素濃度(% HYPER)高(> 41 g/dL)的細胞的百分比大於等於 4.0%，
Hyperchromia（高血紅素濃度）警示就會出現。

% HYPER 參數代表細胞血紅素濃度高於 41 g/dL 的細胞的百分比，該值根據 RBC HC 直方圖得出。

3 種嚴重程度的默認觸發值是：

+ %HYPER = 4.0%至 7.9%

++ %HYPER = 8.0%至 12.0%

+ + + %HYPER > 12.0%

%HYPER 值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關	系統相關
● 遺傳性球形紅血球增多症	1. 檢查 RBC 試劑。
● 鐮狀細胞貧血	2. 檢查激光檢體供應。
● 溶血性尿毒症綜合症	3. 檢查 RBC gains。
	4. 檢查激光流通池校正。

Hypochromia（低血紅素濃度，HYPO）

定義

如果細胞血紅素濃度(% HYPO)低的細胞的百分比大於等於 4.0 %，HyPoChromia（低血紅素濃度）警示就會出現。

% HYPO 參數代表細胞血紅素濃度低於 28 g/dL 的細胞的百分比，該值根據 RBC HC 直方圖得出。

3 種嚴重程度的默認觸發值是：

+ %HYPO = 4.0%至 7.9%

++ %HYPO = 8.0%至 12.0%

+ + + %HYPO % > 12.0%

% HYPO 值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 缺鐵性貧血
- 慢性炎症性疾病
- 地中海貧血
- 鐵粒幼紅血球性貧血

系統相關

1. 檢查 RBC 試劑。
2. 檢查激光檢體供應。
3. 檢查 RBC gains。
4. 檢查激光流通池校正。

Immature Granulocytes（未成熟粒細胞，IG）

定義

疑有未成熟粒細胞出現。

如果[(%NEUT + %EOS) - %PMN] ≥ 5.0%，Immature Granulocytes（未成熟粒細胞）警示就會出現。

如果出現，Immature Granulocytes（未成熟粒細胞）警示會顯示在 Perox 細胞直方圖的嗜中性粒細胞及嗜酸性粒細胞區，以及 Baso 細胞直方圖的單核(MN)區。

在 BASO 細胞直方圖中，嗜酸性粒細胞及嗜中性粒細胞駐留在中性粒細胞(PMN)區。從%NEUT 與%EOS 的和中減去%PMN，就得出%Immature Granulocytes 的估計值。

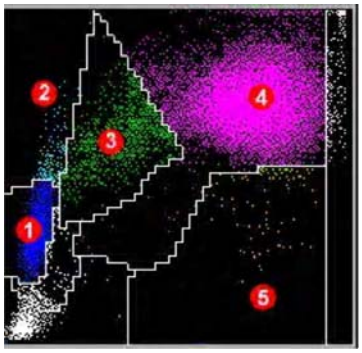
3 種嚴重程度的默認觸發值是：

\+ [(%NEUT + %EOS) - %PMN] = 5.0%至 7.4%

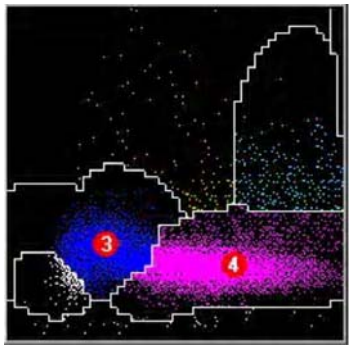
\+ ＋[(%NEUT + %EOS) - %PMN] = 7.5%至 10.0%

\+ + + [(%NEUT + %EOS) - %PMN] > 10.0%

Perox 細胞直方圖



Baso 細胞直方圖



1 Lymph **2** LUC **3** Mono **4** Neut **5** Eos **6** MN **7** PMN

MN (6) = Lymph (1) + LUC (2) + Mono (3)

PMN (7) = Neut (4) + Eos (5)

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關	系統相關
● 髓細胞白血病	1. 對 baso 通道進行故障排除。
● 慢性感染	2. 對 perox 通道進行故障排除。
● 新生兒檢體	3. 檢查 baso 和 perox Gains。

Large Platelets（大血小板，LPLT）

定義

如果大血小板的百分比(% LPLT)大於血小板計數的 10%，就會出現 Large Platelets（大血小板）警示。

% LPLT 參數表明體積大於 20fL 的血小板的百分比。該參數是基於 Integrated Analysis（集成分析），從 Platelet Volume（血小板量）直方圖中得出。

3 種嚴重程度的默認觸發值是：

+ %LPLT = 10.0%至 11.9%

++ %PLT = 12.0%至 14.0%

+++ %LPLT > 14.0%

% LPLT 值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 慢性粒細胞白血病(CML)
- 骨髓移植
- 化療

系統相關

1. 檢查 RBC 試劑。
2. 檢查 RBC 通道液路。
3. 檢查 RBC 與 PLT Gains。
4. 檢查激光流通池校正。

Left Shift（核左移，LS）

定義

疑有未分葉嗜中性粒細胞（杆狀核嗜中性粒細胞）出現。

如果 MN/PMN 谷被杆狀核嗜中性粒細胞遮檔，Left Shift（核左移）警示就會出現。如果%NEUT 低於 30%，這個警示不會出現。

對於正常檢體，分隔 MN 和 PMN 群的波谷根據其相對深度(d/D)具有良好的波形。如果這個波谷變得過窄(d/D < 0.15)，則無法分隔 MN 和 PMN 群。

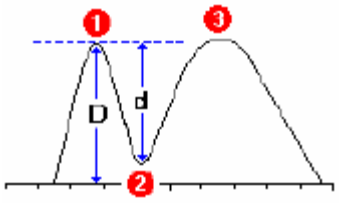
如果 BASO d/D 低於 0.15，+LS 警示就會出現。

Lobularity Index（分葉核指數，LI）用於設定這個警示的嚴重程度。

LI 是 Baso X 直方圖上的 PMN 峰道數除以 14 的結果，對於正常檢體來說，應大於 1.9。值低於 1.9 通常表明檢體異常。

在未出現雙峰分布的檢體中，只有 PMN 波峰高於 20 道的 PMN 群才被視爲有效 PMN 群。如果低於 20 道，軟體會將該峰視爲 MN 群，LI 值將爲空。只要識別出 PMN 峰，就會報告 LI 結果。

注意
如果無 MNx 值，則也沒有分葉核指數(LI)值。



1 MN 尖峰通道

2 MN/PMN 谷底通道

3 PMN 尖峰通道

Left Shift（核左移）的 3 種嚴重程度的默認觸發值是：

+	LI > 1.9
++	LI = 1.7 至 1.9
+++	LI < 1.7

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 陳年舊檢體
- 慢性感染
- 骨髓增生性疾病
- 新生兒檢體

系統相關

1. 對 baso 通道進行故障排除。
2. 對 perox 通道進行故障排除。

Macrocytosis（大紅血球，MACRO）

定義

如果體積大於正常細胞的紅血球的百分比(%MACRO)大於等於 2.5%，就會出現 Macrocytosis（大紅血球）警示。

% MACRO 參數表明體積大於等於 120fL 的紅血球的百分比，從 RBC 體積「分量直方圖」得出。

3 種嚴重程度的默認觸發值是：

+ %MACRO = 2.5%至 6.4%

+ + %MACRO = 6.5%至 10.5%

+ + + %MACRO > 10.5%

% MACRO 值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 大紅血球性貧血
- 酒精中毒
- 溶血性貧血
- 骨髓增生異常性貧血
- 新生兒檢體

系統相關

1. 檢查 RBC 試劑。
2. 檢查 RBC 通道液路。
3. 檢查 RBC gains。
4. 檢查激光流通池校正。

Microcytosis（小紅血球，MICRO）

定義

如果體積小於正常細胞的紅血球的百分比(%MICRO)大於等於 2.5%，Microcytosis（小紅血球）警示就會出現。

% MICRO 參數表明體積小於等於 60fL 的紅血球的百分比，該值根據 RBC HC 直方圖得出。

3 種嚴重程度的默認觸發值是：

+ %MICRO = 2.5%至 6.4%

+ + %MICRO = 6.5%至 10.5%

+ + + %MICRO > 10.5%

% MICRO 值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 缺鐵性貧血
- 血色素疾病
- 溶血性貧血

系統相關

1. 檢查 RBC 試劑。
2. 檢查 RBC 通道液路。
3. 檢查 RBC gains。
4. 檢查激光流通池校正。

Myeloperoxidase Deficiency（髓過氧物酶缺陷症，MPO-D, MO）

定義

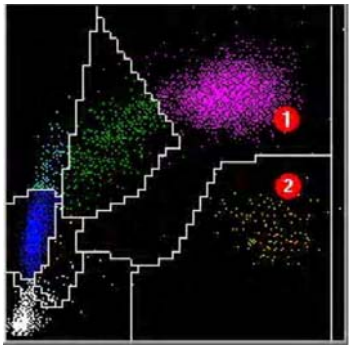
檢體是弱過氧化物酶染色器。

如果[% PMN-(% NEUT + %EOS)] ≥ 25，NRBC 警示未出現，且有有效 MN-PMN 谷(d/D ≥ 0.15)，就會出現該警示。

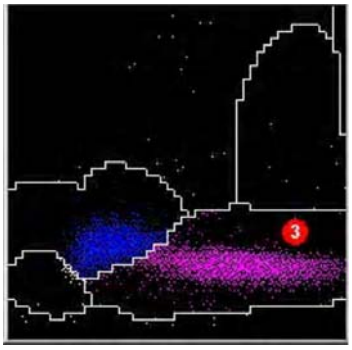
必須對觸發 Myeloperoxidase Deficiency（髓過氧物酶缺陷症）警示的檢體執行手工分類。

正常過氧化物酶染色 弱過氧化物酶染色（MPO 警示）

Perox 細胞直方圖



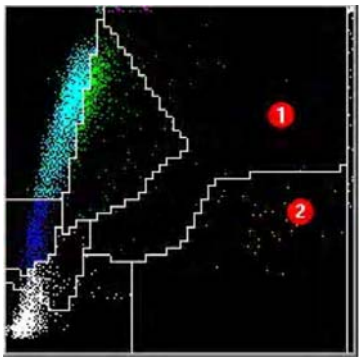
Baso 細胞直方圖



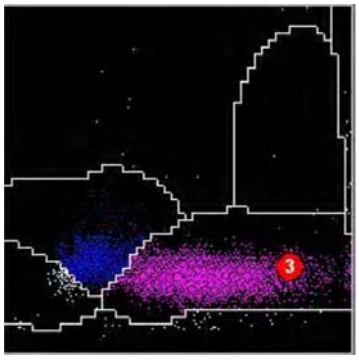
由於%PMN-(% NEUT + %EOS)的結果接近 0，因此沒有實現警示。

通過檢查，NEUT (1)區和(2)區中的事件總和約等於(3)區中的計數。

Perox 細胞直方圖



Baso 細胞直方圖



由於%PMN-(% NEUT + %EOS)的結果大於 25，會出現警示。

通過檢查，NEUT (1)區和 EOS (2)區中的事件總和遠小於 PMN (3)區中的計數。

警示的結果

%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%BASO、#BASO、%LUC 和#LUC

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關	系統相關
● 髓過氧物酶缺陷症	1. 對 perox 通道進行故障排除。 2. 檢查 perox 試劑。 3. 檢查過氧化物酶通道液路。 4. 檢查 perox 反應池溫度。

Nucleated Red Blood Cells（有核紅血球，NRBC）

定義

如果檢測到有核紅血球，或者出現 Suspect Cellular Interference（可疑細胞干擾，NRCELL, NC）警示或（可疑大血小板，NRLPLT）警示，就會出現 NRBC 形態學警示。

這個警示沒有嚴重程度的分類。

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關	系統相關
● 新生兒檢體 ● 血色素疾病 ● 溶血性貧血 ● 骨髓增生異常綜合症	1. 檢查 perox 試劑。 2. 檢查 perox 反應池溫度。 3. 檢查過氧化物酶通道液路和檢體供應。 4. 檢查 perox Gains。

Platelet Clumps（血小板凝集，PLT-CLM, NW）

定義

疑有凝集血小板出現。

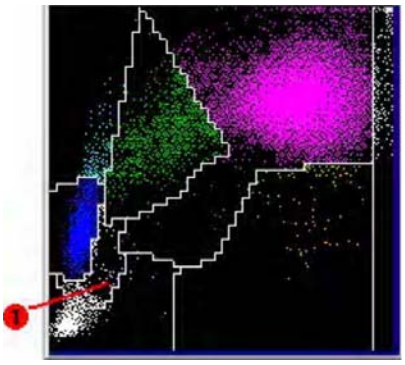
如果 Perox 細胞直方圖的 PLT Clumps（血小板凝集）區中的 Clumps Count（凝集計數）大於 150，就會出現 Platelet Clumps（血小板凝集）警示。PLT 計數警示是爲了警告用戶，由於發生血小板凝集，血小板計數可能不準確。

Perox 細胞直方圖的 PLT Clumps（血小板凝集）區源自 Noise（噪音）區，並向上擴展至淋巴細胞群的右側。從這一區域獲得的事件數稱爲 Clumps Count（凝集計數）。

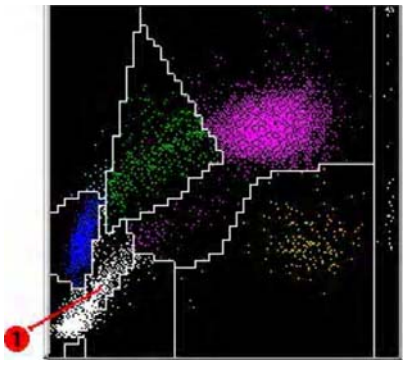
Clumps Count（凝集計數）不包含在 WBCP 和分類結果中。

這個警示沒有嚴重程度的分類。

Perox 細胞直方圖正常檢體



Perox 細胞直方圖 PLT-CLM 警示



1 = PLT 凝集區

警示的結果

WBCP、PLT、PCT、MPV 和 PDW

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 創傷性靜脈穿刺
- 抗凝血劑
- 自體免疫性血小板紊亂
- 血脂

RBC Fragments（紅血球碎片，RBCF）

定義

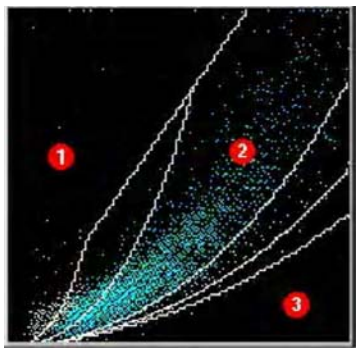
疑有紅血球碎片出現。

如果 PLT Scatter（PLT 散射）細胞直方圖上紅血球碎片區中的事件數大於 100,000 個細胞／μL，就會出現該警示。此區域中的事件計數包括體積小於 30fL 且折光指數大於 1.400 的紅血球碎片。

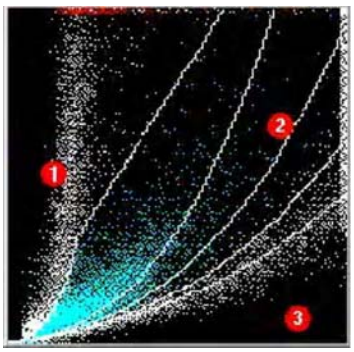
紅血球碎片不包含在 PLT 計數和 RBC 計數內。

這個警示沒有嚴重程度的分類。

Normal PLT Scatter（正常 PLT 散射）細胞直方圖



Abnormal PLT Scatter（異常 PLT 散射）細胞直方圖



1 影紅血球區

2 血小板區

3 紅血球碎片區

注意

只要紅血球碎片與血小板的比率超過 0.25，系統使用日誌正常擬合算式確定血小板計數，且 Platelet Volume（血小板體積）直方圖中會顯示日誌正常擬合曲線。

RB Fragments（紅血球碎片）值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 溶血性貧血
- 人工心臟瓣膜
- 嚴重燒傷
- 鐮狀細胞貧血

RBC Ghosts（影紅血球，RBCG）

定義

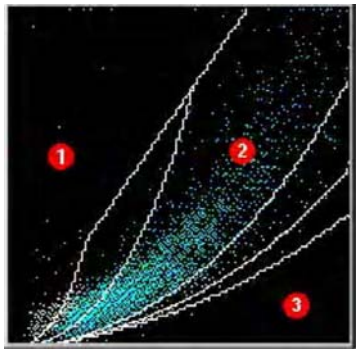
疑有影紅血球出現。

如果 PLT Scatter（PLT 散射）細胞直方圖上 RBC Ghosts（影紅血球）區中的事件數大於 100,000 個細胞／µL，就會出現該警示。此區中計數的事件折光指數低於 1.350。

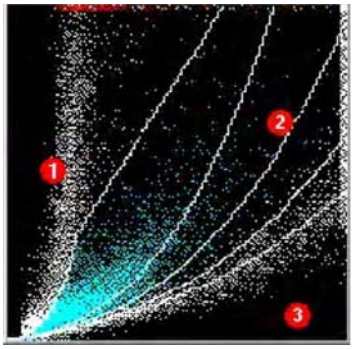
影紅血球不包含在 PLT 計數和 RBC 計數內。

這個警示沒有嚴重程度的分類。

Normal PLT Scatter（正常 PLT 散射）細胞直方圖



Normal PLT Scatter（正常 PLT 散射）細胞直方圖



1 影紅血球區

2 血小板區

3 紅血球碎片區

影紅血球值僅供警示及實驗室用途。

警示的結果

無

可能原因

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

檢體相關

- 溶血
- 冷球蛋白
- 乳糜粒脂蛋白
- 熱異形細胞增多症
- 血脂

檢體／系統警示

總結

通過使用複雜警示算法，實驗室工作人員會對可疑異常檢體和／或系統狀況保持警覺。

Sample/system（檢體／系統）警示顯示在 Run Screen（運行屏幕）和 Review/Edit（檢查／編輯）選項中。

只要此類警示出現，用戶就應該對結果進行檢查並採取建議的措施。下表標明因每個測試的選擇而觸發的檢體／系統警示。圓括號中的二位字母代碼顯示在 Run Screen（運行屏幕）的 Sample/System Flag Analysis（檢體／系統警示分析）面板中。

警示	觸發標準	CBC	CBC/ DIFF	CBC/DIFF/ RETIC	CBC/ RETIC	RETIC
B-SUSP (BC)	在 y 軸上高於 MN/PMN 上閾值，且在 x 軸上的 0 至 49 道中的事件≥ 5%		√	√		
BIFR(BR)	Baso 平直度> 2.5	√	√	√	√	
B-NO(NB)	Baso%噪音> 10	√	√	√	√	
B-NV(VB)	1. (BAS0d/D) < 0.15	√	√	√	√	
	2. 如果 WBC 一致（無 WBC - CE 警示），且[(%NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間，則不設置警示。					
B-SAT(BS)	1. Baso%飽和> 2.5	√	√	√	√	
	2. 如果 WBC 一致（無 WBC - CE 警示）則不設置警示。					

警示	觸發標準	CBC	CBC/ DIFF	CBC/DIFF/ RETIC	CBC/ RETIC	RETIC
BTO(TB)	1. 嗜鹼陸粒細胞箱溫度超出 3139℃至 34.1℃的範圍。 2. 如果 WBC 一致（無 WBC - CE 警示），且[(%NEUT + %+EOS) - %PMN]的結果在 0 至 7.5 之間，則不設置警示。	√	√	√	√	
CHCMCE (CC)	(MCHC - CHCM) > 1.9	√	√	√	√	
HGBIFR (HR)	HGB 檢體平直度> 1000	√	√	√	√	
HGB-PL (PH)	血紅素基準值超出 2.5 至 4.1 的範圍	√	√	√	√	
LAS-PL (PL)	激光光強< 150	√	√	√	√	√
NRCELL (NC)	WBCP/WBCB > 11			√	√	
NR-LPD (NL)	1. BASO%噪音> 2 2. BASO%噪音 x WBCB > 10			√	√	
NRLPLT (NP)	LPLT > 40 x $10^3/\mu L$			√	√	
NRPXNV	有核紅血球群與淋巴細胞群間無波谷，且有可報告核紅血球計數。			√	√	
PLT-NO (NT)	1. 出現任一嚴重程度的 LPLT 和 ANISO 警示。 2. 出現任一嚴重程度的 LPLT 和 MICRO 警示。	√	√	√	√	
PLTORN (OT)	Platelet origin Noise（血小板源的噪音）區中的事件當 PLT 細胞直方圖中總事件數的比例 > 2%	√	√	√	√	

警示	觸發標準	CBC	CBC/ DIFF	CBC/DIFF/ RETIC	CBC/ RETIC	RETIC
PX-NV (VX)	1. (PEROX d/D) < 0.15 2. 如果 WBC 一致（無 WBC - CE 警示），且[(%NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間，則不設置警示。		√	√		
PXIFR (XR)	Perox 平直度> 3.2		√	√		
PX-NO (NX)	1. Perox%噪音> 60% 2. 如果 WBC 一致（無 WBC - CE 警示），且[(%NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間，則不設置警示。		√	√		
PX-PL (PX)	Perox 光強< 90		√	√		
PX-SAT (XS)	1. Perox%飽和度> 10 2. 如果 WBC 一致（無 WBC - CE 警示），則不設置警示。		√	√		
PXTO (TX)	1. Perox 腔室溫度超出 58℃至 72.1℃的範圍。 2. 如果 WBC 一致（無 WBC - CE 警示），且[(%NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間，則不設置警示。		√	√		
RBCIFR (RR)	RBC 平直度> 3.2	√	√	√	√	
RTCint(CT)	血小板閾值低於 5 道			√	√	√
RTCADA (CA)	1. 高斯擬合的吸收模式不在 6 道與 30 道之間。 2. 在高度的 80% 之上的 RETIC Abs 直方圖 SD > 1.4 3. 實測平均吸收率減去理論吸收率> 30			√	√	√

警示	觸發標準	CBC	CBC/ DIFF	CBC/DIFF/ RETIC	CBC/ RETIC	RETIC
RTCIFR (CR)	網狀紅血球平直度> 3.2			√	√	√
RTC-FS (FC)	1. 平均與最頻出現 RETIC Abs 直方圖之差> 15% 2. 高斯擬合的卡方檢驗錯誤 > 80,000			√	√	√
RTC-NO (NO)	噪音源 > 歸類細胞的 10%			√	√	√
RTC-L(CL)	所分析細胞< 10,000			√	√	√
RTC-FL (RF)	RETIC Abs 平直度直方圖的 CV > 3.6			√	√	√
RTCAST (CS)	飽和細胞 > 歸類細胞的 10%			√	√	√
RTC-SE (SE)	吸收軸上陽性細胞群的斜率 > 0.2			√	√	√
WBC-CE (WC)	1. 當 WBCB ≥ 2.0 x 10^3/μL 且 10.0x10^3/μL，(WBCB – WBCP) ≥ 10.0 x 10^3/μL 2. 當 WBCB ≥ 10.0 x 10^3/μL，(WBCB - WBCP) ≥ WBCB 的 10% 3. 當 WBCB ≤ 2.0 x 10^3/μL，(WBCB - WBCP) > 20% WBCB 4. 如果設置 PX - NV 或 PX - NO 警示，則不會出現 WBCB 計數警示。		√	√		
WBCSUB (WS)	如果出現 WBCB 警示而未出現 WBCP 警示，則報告 WBCP 值。 如果 WBCB 和 WBCP 均已警示，則報告 WBCB。 如果 WBCB < 1000 個細胞／μL，則報告帶有星號標記的 WBCB。		√	√		

Baso Count Suspect（疑似嗜鹼性粒細胞計數，B-SUSP, BC）

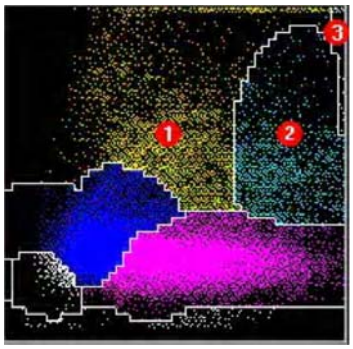
定義

如果 Baso 細胞直方圖位於 MN/PMN 閾值上限之上，且在 x 軸上的 0 至 49 道之間的區域中，獲取的事件的百分比超過 5%，Baso Count Suspect（疑似嗜鹼性粒細胞計數）警示就會出現。

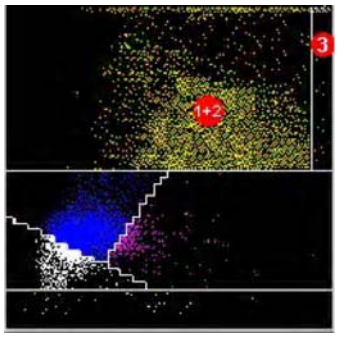
當採用組群分析時，Baso 細胞直方圖的 Baso Count Suspect（疑似嗜鹼性粒細胞計數）區位於 MN/PMN 閾值上限之上。此區中的事件不屬於嗜鹼性粒細胞分類，且不包含在嗜鹼性粒細胞計數中。%BASO Suspect（疑似%BASO）參數是從 Baso Count Suspect（疑似嗜鹼性粒細胞計數）區計算出來的，可在 Run Screen（運行屏幕）上的 Baso Parameter（嗜鹼性粒細胞參數）組中找到。

當採用直方圖分析時，Baso Count Suspect（疑似嗜鹼性粒細胞計數）區位於 y 軸上的 21 道之上，x 軸上的 0 道和 49 道之間。

Baso 細胞直方圖（組群分析）



Baso 細胞直方圖（直方圖分析）



1 嗜鹼性粒細胞

2 疑似嗜鹼性粒細胞

3 嗜鹼性粒細胞飽和

警示的結果

%BASO、#BASO、%LYMPH、#LYMPH、%LUC、#LUC 報告分 4 部分的 WBC 分類（不包括嗜鹼性粒細胞），其中顯示並警示實測 BASO 值，還會警示 LYMPH 值和 LUC 值。

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。
但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。並非有意將該警示與特定診斷相關聯。

系統相關

1. 檢查 baso 試劑。
2. 檢查 baso 反應池溫度。
3. 檢查 baso 通道液路。
4. 檢查 baso Gains。
5. 檢查 RBC/Baso/Retic 流通池校正。

檢體相關

- 高 WBC 計數
- 白血病
- 高 Baso 計數
- 放置時間過長的血液
- 經治療 CLL

Baso Irregular Flow Rate（嗜鹼性粒細胞流速異常，BIFR, BR）

定義

當由於 baso 通道中的水力干擾導致細胞計數率不穩定時，就會出現 Baso Irregular Flow Rate（嗜鹼性粒細胞流速異常）警示。

嗜鹼性粒細胞流速根據細胞計數率估算：

$$\text{流動均勻性} = \sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$$

如果此值大於 2.5，就會出現該警示。

BASO Rate（BASO 率）直方圖顯示 baso 通道中的細胞到達率。

正常 BASO Rate（BASO 率）直方圖



BIFR BASO Rate（BIFR BASO 率）直方圖



警示的結果

WBC、WBCB、%BASO、#BASO

糾正措施

1. 檢查 baso 試劑。
2. 檢查 baso 通道液路。
3. 檢查鞘液供應。

部分阻塞的 RBC/baso/retic 鞘液過濾器會在 RBC、Baso 及 Retic 的流速直方圖上產生明顯的”滑雪斜坡”效果。更換鞘液過濾器。

RBC 率



Baso 率



Retic 率



Baso Noise（嗜鹼性粒細胞噪音，B-NO, NB）

定義

如果在 Baso 細胞直方圖的 Noise（噪音）區中計數的事件超過 baso 信號的 10%，Baso Noise（嗜鹼性粒細胞噪音）警示就會出現。

B-NO (NB)警示可能導致 WBC 計數的替換。

下列規則確定對於 CBC/Diff 檢體來說報告 WBCB 計數還是 WBCP 計數：

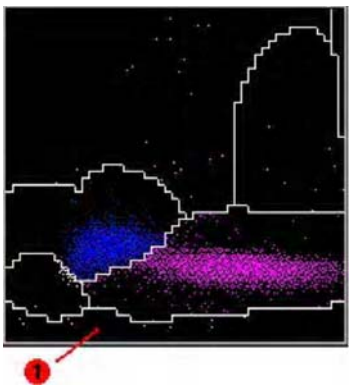
- WBCB 是主 WBC 計數。
- 如果出現 B-NO 或 B-SAT 警示，則如果存在有效 WBCP 計數，就會報告該計數。
- 如果出現 B-NO 警示以及 PX-NO 或 PX-SAT 警示，則報告帶有檢體／系統警示的 WBCB 計數。
- WBCB 被報告爲 WBC 低於 1.0 x $10^3/\mu L$ 的檢體的 WBC 計數。

Baso 細胞直方圖的 Noise（噪音）區(1)由組群分析確定。

如果採用直方圖分析，Noise（噪音）區(2)位於 y 軸上的 0 道與 8 道之間。

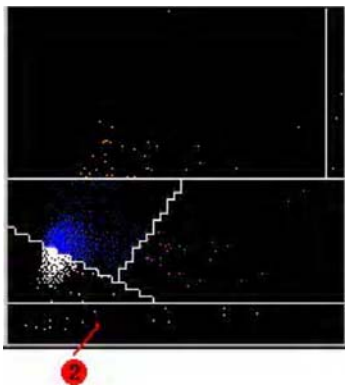
組群分析

1 噪音聚集



直方圖分析

2 噪音區



警示的結果

WBC、WBCB、%BASO、#BASO

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。並非有意將該警示與特定診斷相關聯。

系統相關

1. 檢查 baso 試劑。
2. 檢查 baso 通道液路。
3. 檢查壓力和真空讀數。
4. 檢查鞘液供應。
5. 檢查 baso 反應池溫度。
6. 檢查 RBC/Baso/Retic 流通池校正。

檢體相關

- 血脂
- 高 WBC 計數
- 極端嗜酸性粒細胞
- 瘧原蟲
- 放置時間過長的血液標本

Baso No Valley（Baso 無波谷，B-NV, VB）

定義

如果在 Baso 細胞直方圖中，單核(MN)群與中性粒細胞(PMN)群之間沒有有效分隔，Baso No valley（Baso 無波谷）警示就會出現。

如果出現下列兩種狀況，表明 baso 結果和 perox 結果相符，不會出現 B- NV (VB)警示：

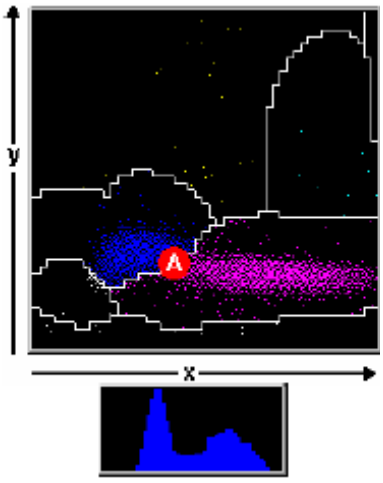
WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示）

[(% NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間

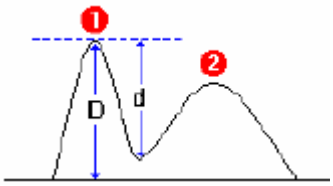
沿 Baso 細胞直方圖的 x 軸的 MN 和 PMN 群的分隔，由兩個群間波谷的相對深度來估算。

在正常檢體中，相對 Baso d/D 大於 0.15。如果相對深度低於 0.15，且 Perox 結果與 baso 結果不一致，就會出現 B-NV 警示。

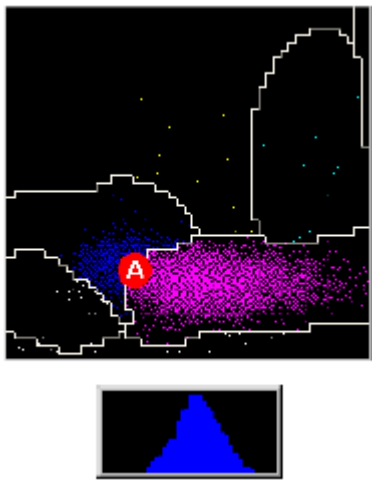
正常



1 MN 峰
2 PMN 峰
A MN/PMN 谷



B-NV (VB)警示



警示的結果

LI

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。並非有意將該警示與特定診斷相關聯。

系統相關

1. 檢查 baso 試劑。
2. 檢查 baso 通道液路。
3. 檢查 baso 反應池溫度。
4. 檢查鞘液供應。
5. 檢查 RBC/Baso/Retic 流通池校正。

檢體相關

- 放置時間過長的血液標本
- 絕對淋巴細胞增多症
- 未成熟粒細胞
- 未分葉嗜中性粒細胞狀核嗜中性粒細胞）

Basosaturation（嗜鹼性粒細胞飽和，B-SAT, BS）

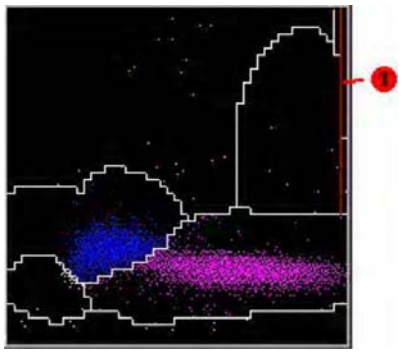
定義

如果 Baso 細胞直方圖中 Saturation（飽和）區內的事件數高於 baso 的 2.5%，Baso Saturation（Baso 飽和）警示就會出現。

如果 WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示），則這個警示不會出現。

Baso 細胞直方圖中的 Saturation（飽和）區位於 MN/PMN 閾值上限上方(1)的 46 道上的固定閾值的右側。此區可能包括氣泡、未裂解細胞以及細胞團。

Baso 細胞直方圖



1 Baso Saturation（Baso 飽和）區

B-SAT (BS)警示可能導致 WBC 計數的替換。

下列規則用來決定檢體的 CBC/Diff 計數報告選擇 WBCB 還是 WBCP：

(1) 白細胞計數首選 WBCB 計數結果

(2) 如果出現 B-N0 或 B-STAT 警示，但 WBCP 計數結果有效，選擇 WBCP 結果報告

警示的結果

WBCB

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。並非有意將該警示與特定診斷相關聯。

系統相關

1. 檢查 baso 試劑。
2. 檢查壓力和真空讀數。
3. 檢查鞘液供應。
4. 檢查 baso 通道液路。
5. 檢查 RBC/Baso/Retic 流通池校正。

檢體相關

- 白血病（高 WBC）
- 真菌感染
- 細胞團

Baso Temperature out of Range（嗜鹼性粒細胞溫度超出範圍，BTO, TB）

定義

如果嗜鹼性粒細胞反應池的溫度超出 31.9℃至 34.1℃的範圍，就會出現 Baso Temperature Out of Range（嗜鹼性粒細胞溫度超出範圍）警示。

如果出現下列兩種狀況，表明 baso 結果和 perox 結果相符，不會出現 BTO (TB)警示：

- WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示）
- [(% NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間

警示的結果

WBC、WBCB、%BASO、#BASO、%LYMPH、#LYMPH 報告分 4 部分的 WBC 分類（不包括嗜鹼性粒細胞），其中顯示並警示實測 BASO 值，LYMPH 值和 LUC 值也被警示。

糾正措施

1. 檢查 baso 反應池溫度。
2. 檢查反應池溫度控制器，包括電氣連接。

Comparison Error MCHC/CHCM（比較錯誤 MCHC/CHCM, CHCMCE, CC）

定義

如果 MCHC 值和 CHCM 值之差大於 1.9，Comparison Error MCHC/CHCM（比較錯誤 MCHC/CHCM）警示就會出現。

警示的結果

MCHC、CHCM、RBC、MCV、HGB、HCT、MCH、RDW、HDW、CH、CHDW

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 如果有另一警示與比較錯誤警示一起出現，先對錯誤進行故障排除。
2. 要確定故障通道，將同一正常全血檢體運行 5 次，以檢查 RBC、MCV 和 HGB 值的精確度。然後運行正常水平控制以檢查準確性。
 a. 如果所有結果均可接受，校正 RBC、MCV、CHCM 和 HGB 參數。
 b. 如果 HGB 結果錯誤，對血紅素通道進行故障排除。
 c. 如果 RBC 結果或 MCV 結果錯誤，對 RBC 通道進行故障排除。

檢體相關

- 血脂
- 白血病（高 WBC）
- 新生兒(NRBCs)
- 溶血性貧血
- 冷凝集素

Comparison Error WBCB/WBCP（比較錯誤 WBCB/WBCP, WBC-CE, WC）

定義

如果從 baso 通道和 perox 通道獲得的 WBC 計數之間的差超出預先設置的限制，就會出現 Comparison Error WBCB/WBCP（比較錯誤 WBCB/WBCP）警示。

每個檢體的 WBC 計數都是在 baso 通道(WBCB)和 perox 通道(WBCP)中單獨確定的。

在下列情況下，會出現該警示：

- (WBCB-WBCP) ≥ 1.0 x 10^3 /μL (WBCB ≥ 2.0x10^3 /μL 和 ≥10.0 x 10^3 /μL 時）
- (WBCB-WBCP) ≥ 10% of WBCB (WBCB ≥ 10.0 x 10^3 /μL 時）
- (WBCB-WBCP) ≥ 20% of WBCB (WBCB ≥ 2.0 x 10^3 /μL 時）

警示的結果

WBC、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%BASO、#BASO、%LUC、#LUC

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 如果出現 Perox Noise（Perox 噪音，PX-NO）。和／或 No Valley Perox（Perox 無谷，PX-NV）檢體／系統警示，對 perox 通道進行故障排除。
2. 如果無 perox 警示，對 baso 通道進行故障排除。

檢體相關

- 未完成紅血球裂解
- 有核紅血球
- 瘧原蟲

Hgb Irregular Flow Rate（血紅素流速異常，HGBIFR, HR）

定義

如果血紅素基準值或檢體透射值不穩定，Hgbl Irregular Flow Rate（血紅素流速異常）警示就會出現。

對於每個檢體，對於基準值和檢體透射值，會得出最高和最低透射值之間的差值。

如果基準值或檢體值高於 1000，這個警示就會出現。

HGB Trans 直方圖



1 檢體透射值
2 基準透射值

警示的結果

HGB、MCH 和 MCHC

糾正措施

1. 檢查 HGB 試劑。
2. 檢查血紅素通道液路和檢體供應。
3. 檢查鞘液沖洗液的供應。
4. 檢查壓力和真空讀數。

Hgb Power Low（血紅素能量低，HGB-PL, PH）

定義

如果血紅素基準透射值低於 2.5 或高於 4.1，Hgb Power Low（血紅素能量低）警示就會出現。

警示的結果

HGB、MCH 和 MCHC

糾正措施

1. 調整血紅素基準值。
2. 執行沖洗試劑檢查。
3. 更換 Hgb 燈。

Laser Power Low（激光能量低，LAS-PL, PL）

定義

如果 RBC/Baso/Retic 通道中激光光強低於 150，Laser Power Low（激光能量低）警示就會出現。

警示的結果

RBC、HCT、MCV、MCH、MCHC、CH、CHDW、CHCM、RDW、HDW、PLT、MPV、PDW、WBCB、WBC、%BASO、#BASO、#RETIC、%RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDWr

糾正措施

1. 沖洗 RBC/Baso/Retic 流通池。
2. 執行鞘液試劑檢查。
3. 取出 RBC/Baso/Retic 流通池進行清潔。
4. 更換激光二極管。

No Perox NRBC/Lymph Valley（無 Perox NRBC／淋巴細胞谷，NRPXNV, NV）

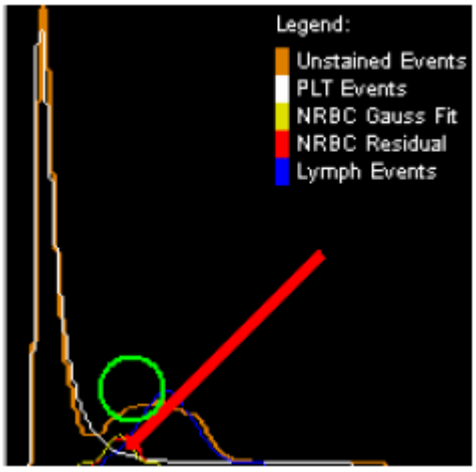
當系統報告 NRBC 計數時，如果 nRBC 和淋巴細胞群間沒有將其隔開的波谷，No Perox NRBC/Lymph Valley（無 Perox NRBC／淋巴細胞谷）警示就會出現。

警示的結果

#NRBC、%NRBC、WBC、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%BASO、#BASO、%LUC、# LUC

下方的 NRBC Enumeration（NRBC 計數）直方圖和 Noise-lymph（噪音－淋巴細胞）直方圖兩圖中的綠色圓圈顯示出，沒有將 nRBC 群和淋巴細胞事件隔開的波谷。紅色箭頭指示 nRBC 事件。

NRBC Enumeration（NRBC 計數）直方圖



Noise lymph（噪音一淋巴細胞）直方圖



Perox Irregular Flow Rate（Perox 流速異常，PXIFR, XR）

定義

當由於 perox 通道中的水力干擾導致細胞計數率不穩定時，perox Irregular Flow Rate（perox 流速異常）警示就會出現。

Perox 流速是根據細胞計數率來估算的：

$$\text{流動均勻性} = \sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$$

如果此值大於 3.2，該警示就會出現。

Perox Rate（Perox 率）直方圖顯示 perox 通道中的細胞到達率。

Normal Perox Rate
（正常 Perox 率）直方圖



PXIFR Perox Rate
（PXIFR Perox 率）直方圖



警示的結果

WBCP、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、# MONO、%EOS、#EOS、%LUC 和#LUC

糾正措施

1. 檢查 perox 試劑。
2. 檢查 perox 通道液路和檢體的供應。
3. 檢查鞘液供應。
4. 檢查壓力和真空讀數。

Perox No Valley（Perox 無波谷，PX-NV, VX）

定義

在 Perox 細胞直方圖中，如果噪音和淋巴細胞群間沒有有效將其隔開的波谷，Perox No valley（Perox 無波谷）警示就會出現。

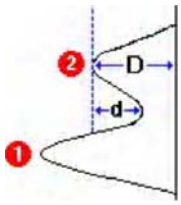
沿 Perox 細胞直方圖的 y 軸的噪音和淋巴細胞群分隔，由兩個群間波谷的相對深度(PEROX d/D)來估算。

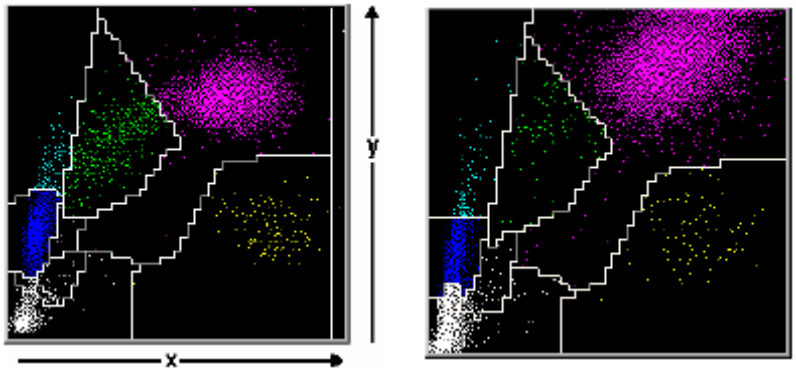
在正常檢體中，PEROX d/D 大於 0.15。如果 PEROX d/D 不低於 0.15，這個警示就會出現。

正常　　PX-NV (VX)警示

1 噪音峰

2 淋巴細胞峰





噪音一淋巴細胞　　噪音一淋巴細胞





如果出現下列兩種狀況，表明 baso 結果和 perox 結果相符，不會出現 BTO (TB)警示：

WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示）

[(% NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間

警示的結果

WBCP、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%LUC 和#LUC

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢查 perox 試劑。
2. 檢查過氧化物酶通道液路和檢體供應。
3. 檢查鞘液沖洗液的供應。
4. 檢查 PEROX 鞘液供應。
5. 檢查壓力和真空讀數。
6. 檢查 perox 反應池溫度。
7. 檢查 perox 流通池校正。
8. 檢查 perox Gains。

檢體相關

- 新生兒檢體
- 放置時間過長的血液標本杯本
- 瘧原蟲

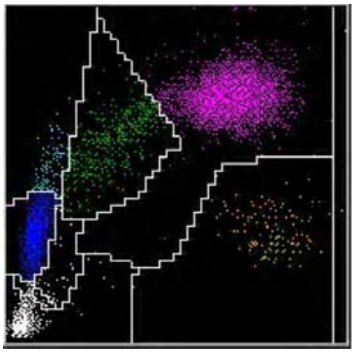
Perox Noise（Perox 噪音，PX-NO, NX）

定義

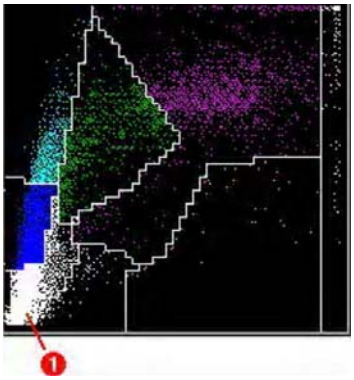
如果 60%以上的 perox 信號來自 Perox 細胞直方圖的 Noise（噪音）區，Perox Noise（Perox 噪音）警示就會出現。

如果 60%以上的 PEROX 事件是在 Noise（噪音）區中計數的，這個警示就會出現。

正常 Perox 細胞直方圖



PX-NO Perox 細胞直方圖



1 Noise（噪音）區

如果出現下列兩種狀況，表明 baso 結果和 perox 結果相符，則不會出現 Px-No (NX)警示：

WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示）[(% NEUT + %EOS) - %PMN]的結果在 0 和 7.5 之間。Noise（噪音）區位於 Perox 細胞直方圖(1)的左下角。

警示的結果

WBCP、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%LUC 和#LUC

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢查 perox 試劑。
2. 檢查過氧化物酶通道液路和檢體供應。
3. 檢查鞘液沖洗液的供應。·
4. 檢查 PEROX 鞘液供應。
5. 檢查壓力和真空讀數。
6. 檢查 perox 反應池溫度。
7. 檢查 perox 流通池校正。
8. 檢查 perox Gains。

檢體相關

- 新生兒檢體
- 放置時間過長的血液標本
- 瘧原蟲
- 難溶紅血球

Perox Power Low（Perox 能量低，PX-PL, PX）

定義

如果 Perox 通道中鹵鎢燈的光強低於 90 , Perox Power Low（Perox 能量低）警示就會出現。

警示的結果

WBCP、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%LUC 和#LUC

糾正措施

1. 執行鞘液試劑檢查。
2. 檢查 perox 燈校正。
3. 更換鹵鎢燈。

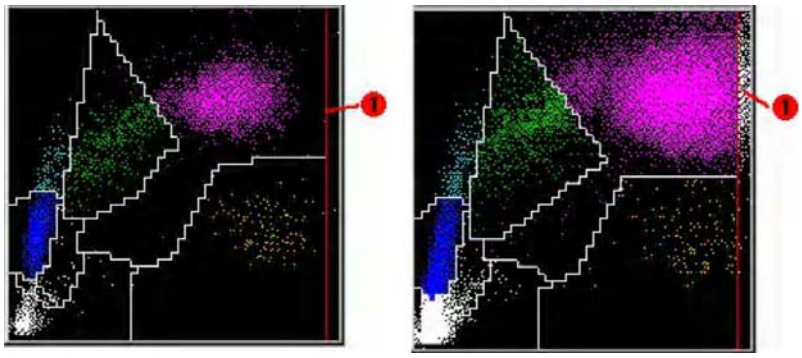
Perox 飽和（Perox 飽和，PX-SAT, XS）

定義

如果 Saturation（飽和）區中計數的事件超過 Perox 信號的 10%，Perox 飽和（Perox 飽和）警示就會出現。

Perox 細胞直方圖的 Saturation（飽和）區位於 x 軸上的 97 道至 99 道。

正常 Perox 細胞直方圖　　PX-SAT Perox 細胞直方圖



1 Saturation（飽和）區

如果 WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示），則 PX-SAT (XS) 警示不會出現。

WBCP 計數不包括來自 Saturation（飽和）區的事件。

警示的結果

WBCP、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%LUC 和#LUC

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明分析儀存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢查 perox 試劑。
2. 檢查過氧化物酶通道液路和檢體供應。
3. 檢查鞘液沖洗液的供應。
4. 檢查 PEROX 鞘液供應。
5. 檢查壓力和真空讀數。
6. 檢查 perox 反應池溫度。
7. 檢查 perox 流通池校正。
8. 檢查 perox Gains。

檢體相關

- 未成熟粒細胞
- 嚴重毒性顆粒
- 早幼粒細胞白血病

Perox Temperature out of Range（Perox 溫度超出範圍，PXTO, TX）

定義

如果過氧化物酶反應池的溫度超出 58℃至 72.1℃的範圍，Perox Temperature out of Range（Perox 溫度超出範圍）警示就會出現。

如果出現下列兩種狀況，表明 baso 結果和 perox 結果相符，不會出現 PXTO (TX)警示：

- WBCB 和 WBCP 在特定限制內基本相符（無 WBC-CE 警示）
- [(% NEUT + %EOS) - %PMN]的結果在 0 至 7.5 之間

警示的結果

WBCP、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%LUC 和#LUC

糾正措施

1. 檢查 perox 反應池溫度。
2. 檢查反應池溫度控制器，包括電氣連接。

Platelet Noise（血小板噪音，PLT-NO , NT)

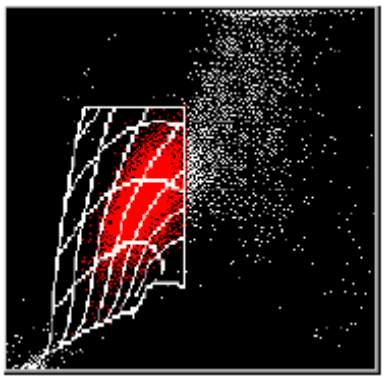
定義

PLT-NO 警示表明出現檢體干擾，如出現了可能被計數爲大血小板的小紅血球或紅血球碎片。

出現下列任一狀況，PLT-NO 警示就會出現：

- 出現任一嚴重程度的 LPLT 和 ANISO 警示。
- 出現任一嚴重程度的 LPLT 和 MICRO 警示。

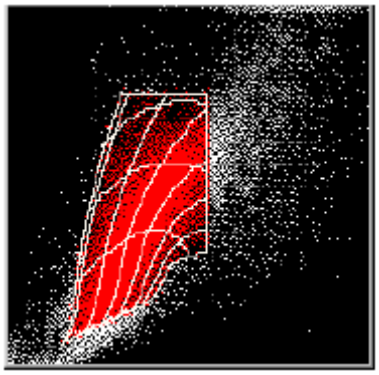
正常檢體紅血球散射



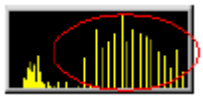
血小板體積



PLT-NO 警示紅血球散射



血小板體積



警示的結果

PLT、PCT、MPV 和 PDW

糾正措施

下列狀況可能未包括所有導致該警示出現的狀況。

- 明顯的小紅血球
- 紅血球碎片增多(RBCF)

Platelet Origin Noise（血小板源的噪音，PLTORN, OT）

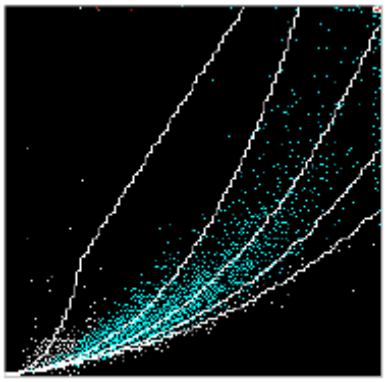
定義

Platelet Origin Noise（血小板源的噪音）警示指示出現系統誘發的噪音，它們可能影響 RBC 結果和 PLT 結果。

如果 PLT 細胞直方圖的 Platelet Origin Noise（血小板源的噪音）區中的事件數超過總事件數的 2%，PLTORN 警示就會出現。

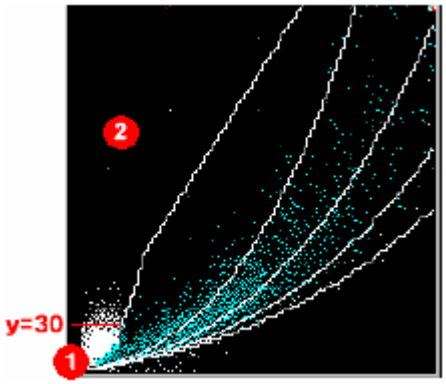
正常檢體

PLT 細胞直方圖



PLTORN 警示

PLT 細胞直方圖



1 血小板源的噪音區

2 影紅血球區

警示的結果

RBC、MCV、HCT、MCH、MCHC、CH、CHCM、CHDW、RDW、HDW、PLT、PCT、MPV 和 PDW

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。

- 檢查 RBC/PLT 試劑
- 請聯繫您的 Siemens 現場服務代表

RBC Irregular Flow Rate（紅血球流速異常，RBCIFR, RR）

定義

當由於 RBC/PLT 通道中的水力干擾導致細胞計數率不穩定時，RBC Irregular Flow Rate（紅血球流速異常）警示就會出現。

RBC 流速是根據細胞計數率來估算的：

$$\text{流動均勻性} = \sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$$

如果該值大於 3.2，這個警示就會出現。RBC Rate（RBC 率）直方圖顯示 RBC 通道中的細胞到達率。

正常 RBC 率直方圖



RBCIFR RBC 率直方圖



警示的結果

RBC、HCT、MCV、MCH、MCHC、CHCM、CH、CHDW、RDW、HDW、PLT、MPV、PDW

糾正措施

1. 檢查 RBC 試劑
2. 檢查 RBC 通道液路
3. 檢查鞘液供應
4. 檢查壓力和真空讀數

部分阻塞的 RBC/baso/retic 鞘液過濾器會在 RBC、Baso 及 Retic 的流速直方圖上產生明顯的”滑雪斜坡”效果。更換鞘液過濾器。

RBC 率



Baso 率



Retic 率



Retic-Plt InterferenceIError（網狀紅血球一血小板干擾／錯誤，RTCint, CT）

定義

如果血小板閾值被設置爲在散射通道 5 之下，RTCint 警示就會出現。如果出現該警示，血小板可能計數在歸類成熟紅血球群中。

警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWg、CHDWr、MCVg、MCVr、RDWg、RDWr

糾正措施

1. 檢查網狀紅血球試劑。
2. 沖洗流通池。

Retic Absorption Distribution Abnormal（網狀紅血球吸收分布異常，RTCADA, CA）

定義

如果歸類細胞群的吸收分布異常，RTCADA 警示就會出現。

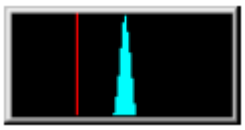
該直方圖的吸收分布異常，致使網狀紅血球群歸類不正確。

在下列情況下，會出現該警示：

吸收直方圖的計算後高斯擬合的最頻值在 6 道之下。 Retic Abs



吸收直方圖的計算後高斯擬合的最頻值在 30 道之上。 Retic Abs



在原直方圖高度 80%之上的吸收直方圖 SD 大於 1.4。 Retic Abs



實測平均吸收率減去理論吸收率的結果大於 30%。 Retic Abs F



警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDW

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢查網狀紅血球試劑。
2. 檢查 RBC/Baso/Retic 通道液路。
3. 檢查網狀紅血球通道液路。
4. 檢查鞘液供應。
5. 檢查壓力和真空讀數。

檢體相關

- 放置時間過長的血液
- 輸血
- 鐮狀細胞貧血
- NRBC 數高

Retic Absorption Flatness（國鋇紅血球吸收平直度，RTC-FL, RF）

定義

當 Retic AbsorPtion Flatness（網狀紅血球吸收平直度）直方圖的差異系數(CV)大於 3.6 時，Retic Absorption Flatness（網狀紅血球吸收平直度）警示就會出現。

警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDWr

糾正措施

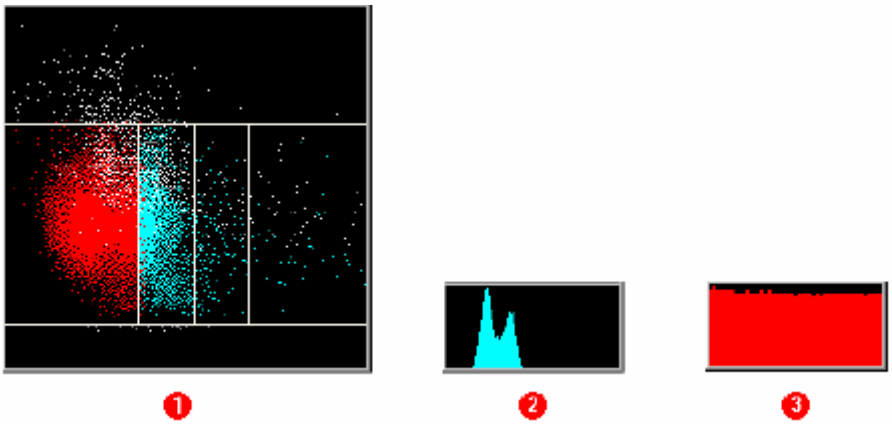
激光振盪（模式跳變）

激光振盪（也稱模式跳變），是指在分析過程中對激光輸出頻率的改變。

- 通常這種狀況會觸發 3 種檢體／系統警示。
- 由於 RETIC Scatter Absorption（網狀紅血球散射吸收）細胞直方圖(1)和 RETIC Absorption（網狀紅血球吸收）直方圖(2)中出現雙模吸收群，導致 Retic Fit Suspect（疑似網狀紅血球擬合，RTC-FS）警示出現。由於 RETIC Absorption（網狀紅血球吸收）直方圖(2)中出現雙模吸收群，導致 Retic Absorption Distribution Abnormal（網狀紅血球吸收分布異常，RTCADA, CA）警示出現。

- 由於 RETIC ABS Flatness（網狀紅血球吸收平直度）直方圖(3)中吸收信號出現極大差異，導致 RETIC Absorption Flatness（網狀紅血球吸收平直度，RTC-FL）警示出現。

在這些情況下，操作者必須重新運行檢體。



Retic Fit Suspect（疑似網狀紅血球擬合，RTC-FS, FC）

定義

如果出現下面的情況，RetiC Fit Suspect（疑似網狀紅血球擬合）警示就會出現：

- RETIC Absorption（網狀紅血球吸收）直方圖的高斯擬合平均值與最頻值的差異在15%以上。
- 高斯擬合的卡方檢驗錯誤大於 80,000。

警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWg、CHDWr、MCVg、MCVr、RDWg、RDWr

糾正措施

下面列出導致該警示出現的原因可能未包含所有狀況，亦並非有意將該警示與特定診斷相關聯。

- 輸血
- 鐮狀細胞貧血
- NRBC 過多

Retic Irregular Flow Rate（困組紅血球流速異常，RTCIFR, CR）

定義

當由於網狀紅血球通道中的水力干擾導致細胞計數率不穩定時，Retic Irregular Flow Rate（網狀紅血球流速異常）警示就會出現。

網狀紅血球流速是根據細胞計數率來估算的：

$$\text{流動均勻性} = \sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$$

如果此值大於 3.2，該警示就會出現。

Retic Rate（Retic 率）直方圖顯示網狀紅血球通道中的細胞到達率。

正常 Retic 率直方圖



RTCIFR Retic 率直方圖



警示的結果

%RETIC、#RETIC

糾正措施

1. 檢查網狀紅血球試劑。
2. 檢查激光檢體供應。
3. 檢查網狀紅血球通道液路。
4. 檢查鞘液供應。
5. 檢查壓力和真空讀數。

部分阻塞的 RBC/baso/retic 鞘液過濾器會在 RBC、Baso 及 Retic 的流速直方圖上產生明顯的”滑雪斜坡”效果。更換鞘液過濾器。

RBC 率



Baso 率



Retic 率



Retic Noise Origin（網狀紅血球噪音源，RTC-NO, NO）

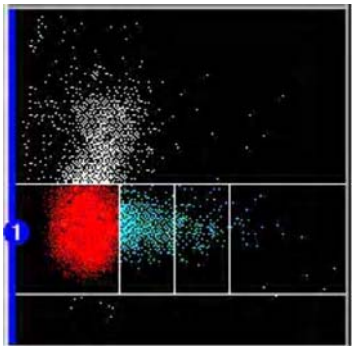
定義

如果超過 10%的歸類細胞信號來自 RETIC Scatter Absorption（網狀紅血球散射吸收）細胞直方圖的 Noise Origin（噪音源）區，Retic Noise Origin（網狀紅血球噪音源）警示就會出現。

Retic Scatter Abs（網狀紅血球散射吸收）細胞直方圖的 Origin Noise（源噪音）區位於吸收通道 1 至 3 中。

通常，在這一區域中檢測到過量事件是由於非球形細胞或不當設置增加導致的。

正常網狀紅血球散射吸收細胞直方圖



Noise Origin（噪音源）區

警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDWr

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢查鞘液試劑的供應。
2. 檢查鞘液沖洗液的供應。
3. 檢查 RBC/Baso/Retic 通道液路，包括反應池。
4. 檢查網狀紅血球通道液路。
5. 檢查網狀紅血球 Gains。

檢體相關

- 高血小板計數
- 紅血球碎片
- 放置時間過長的血液
- 鐮狀細胞貧血

Retic RBC Count Low（網狀紅血球 RBC 計數低，RTC-L, CL）

定義

如果分析的細胞數低於 10,000 今，Retic RBC Count Low（網狀紅血球 RBC 計數低，RTC-L, CL）警示就會出現。

警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDWr

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢體不足。
2. 開管進樣器探針長度不正確。
3. 更換血凝塊過濾器。
4. 檢查網狀紅血球通道液路。

檢體相關

- 貧血

Retic Saturation（網狀紅血球飽和，RTCSAT, CS）

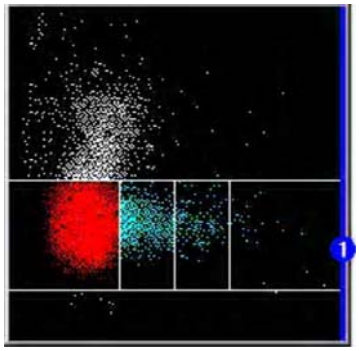
定義

如果超過 10%的歸類細胞信號來自 RETIC Scatter Absorption（網狀紅血球散射吸收）細胞直方圖的 Saturation Cell（飽和細胞）區，就會出現 Retic Saturation（網狀紅血球飽和）警示。

Retic Scatter Absorption（網狀紅血球散射吸收）細胞直方圖的 Saturation Cell（飽和細胞）區位於吸收通道 94 至 100 中。

正常

網狀紅血球散射吸收細胞直方圖



1 飽和區

警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDWr

糾正措施

如果該警示多次出現，特別是對於連續檢體，往往說明系統存在問題。但是，孤立警示實例通常與檢體相關。

下面列出的檢體相關原因可能未包含所有導致出現該警示的情況。此警示並未與特定診斷相關聯。

系統相關

1. 檢查鞘液試劑的供應。
2. 檢查鞘液／沖洗液的供應。
3. 檢查 RBC/Baso/Retic 通道液路。
4. 檢查網狀紅血球通道液路。
5. 檢查網狀紅血球 Gains。

檢體相關

- 未成熟網狀紅血球或新生兒 (NRBC)
- WBC 高

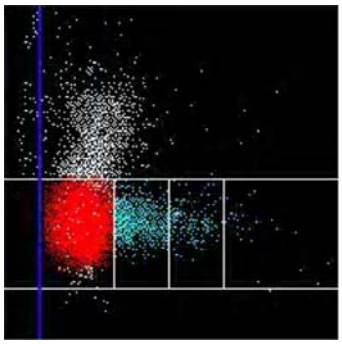
Retic Slope Error（網狀紅血球斜率錯誤，RTC-SE, SE）

定義

在採用斜率校正前，如果吸收軸上的陽性細胞群的斜率大於 0.2，Retic Slope Erro（網狀紅血球斜率錯誤）警示就會出現。

在 RETIC Scatter Absorption（網狀紅血球散射吸收）細胞直方圖上，陽性細胞群應顯示爲平行於 y 軸。如果信號出現前傾或後傾，可能將無法正確歸類信號。

正常網狀紅血球散射吸收細胞直方圖



警示的結果

%RETIC、#RETIC、CHg、CHr、CHCMg、CHCMr、CHDWr、CHDWg、MCVg、MCVr、RDWg、RDWr

糾正措施

下面列出的項目可能未包含導致該警示出現的所有原因，並且該警示並未與特定診斷相關聯。

- **放置時間過長的血液**
- 鐮狀細胞貧血

Suspect Cellular Interference（可疑細胞干擾，NRCELL, NC）

定義

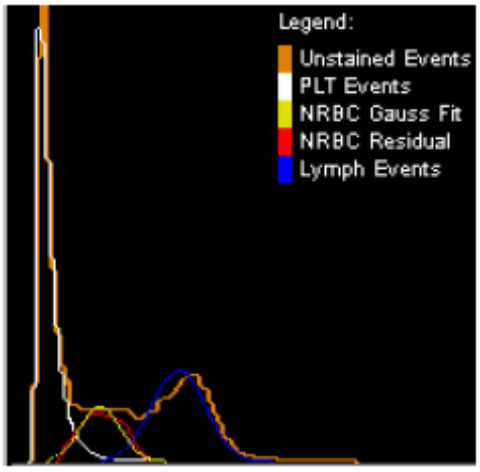
如果有可能出現未裂解紅血球，Suspect Cellular Interference（可疑細胞干擾）警示就會出現。如果過氧化物酶通道 WBC 計數(WBCP)大於嗜鹼性粒細胞／分葉核 WBC 計數(WBCB)，且差值超過特定範圍，這個警示就會出現。

警示的結果

#NRBC、%NRBC、WBC、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、#LUC、%EOS、#EOS、%BASO、#BASO、%LUC、#LUC

NRBC Enumeration（NRBC 計數）直方圖和 Noise-lymph（噪音一淋巴細胞）直方圖兩圖，都經常顯示沒有將 nRBC 群與噪音事件隔開的波谷或將 nRBC 群與淋巴細胞隔開的波谷。

NRBC Enumeration（NRBC 計數）直方圖



Noise lymph（噪音一淋巴細胞）直方圖



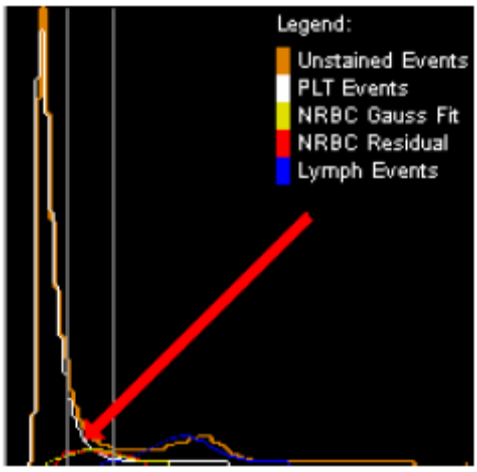
Suspect Large Plt Interference（可疑大血小板干擾，NRLPLT, NP）

如果在 RBC/PLT 通道中，系統計數的大血小板數超過 40,000 個／µL，Suspect Large Plt Interference（可疑大血小板干擾）警示就會出現。

警示的結果

#NRBC、%NRBC、WBC、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%BASO、#BASO、%LUC、# LUC

NRBC Enumeration（NRBC 計數）直方圖



如圖左側所示，大血小板可能會遮擋 nRBC 群。

Suspect Lipid Interference（可疑脂類干擾，NR-LPD, NL）

定義

當系統報告 NRBC 計數時，如果嗜鹼性粒細胞／分葉核通道的噪音區中的信號數超出特定範圍，Suspect Lipid Interference（可疑脂類干擾）警示就會出現。

當下列兩種狀況都出現時，NR-LPD 警示就會出現：

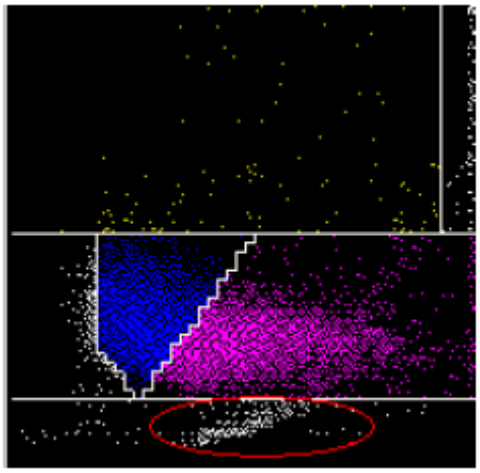
- Baso%噪音> 2
- BASO%噪音 x WBCB > 10

警示的結果

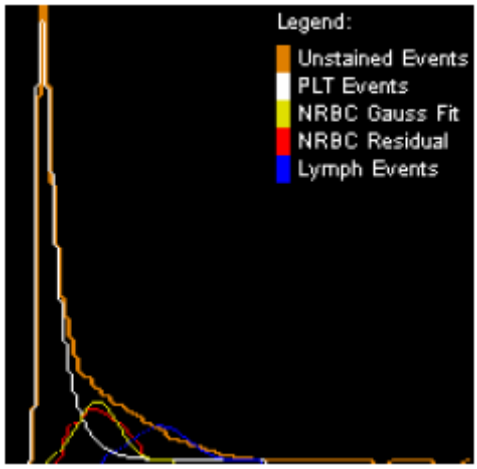
NRBC、%NRBC、WBC、%NEUT、#NEUT、%LYMPH、#LYMPH、%MONO、#MONO、%EOS、#EOS、%BASO、#BASO、%LUC、# LUC

下面的 Baso 細胞直方圖和 NRBC 枚舉直方圖對 NR-LPD 警示做出了說明。Baso 細胞直方圖中圈出的區域指示脂類圖像。

Baso 細胞直方圖



NRBC Enumeration（NRBC 計數）直方圖



WBC Substitution（WBC 替換，WBCSUB, WS）

用於 CBC/DIFF 檢體的 WBC 替換規則如下：

- 如果無 BASO Noise（嗜鹼性粒細胞噪音，B-NO）或 BASO Saturation（嗜鹼性粒細胞飽和，B-SAT）警示，WBCB 就作爲 WBC 計數報告。
- 如果 WBCB 帶有 NB 或 BSAT 警示，WBCP 無以下警示，則用 WBC 計數替換 WBCP：
 - Perox No Valley（Perox 無谷，PX-NV）
 - Perox 飽和（Perox 飽和，PX-SAT）
 - Noise Perox（Perox 噪音，PX-NO）
- 如果 WBCB 和 WBCP 都被警示，則 WBCB 警示作爲 WBC 計數來報告。

- 如果 WBCB 低於 1000 個細胞／mL，則 WBCP 計數不能替換爲 WBC 計數。WBCB 計數報告爲 WBC 計數並被警示。

狀態欄消息

% 3
2 4
4 4
5 6
8 6
9 7
A 7
B 39
C 43
D 47
E 49
F 50
H 51
I 54
J 60
K 60
L 60
M 61
N 63
O 69
P 70
Q 83
R 83
S 92
T 98

U **99**
V **101**
W **103**
X **104**
Y **104**
Z **104**

%

% Disk Space Used - Alarm（已使用的磁碟空間百分比一警報）

使用的磁碟空間已增加到警報標準指定的水平，說明可用磁碟空間較低。

糾正措施

通過刪除下列所有文件中的數據來增加可用磁碟空間：

- 原始數據文件
- 導出文件
- 檢體結果（使用 Customize（自定義）、System Setup（系統設置）、Tools Modify（修改工具）、End of Day（工作結束））
- 日誌：消息日誌、維修日誌、用戶記事簿、試劑日誌、工作量日誌

重要訊息

刪除文件會永久性地擦除文件。如果需要數據的電子副本，請在刪除前備份或導出文件。

% Disk Space Used - Stop（已使用的磁盤空向百分比一停止）

已使用的磁碟空間已增加到停止標準中指定的水平，自動進樣器已中止。如果沒有配置停止／警示標準，則默認水平值設置爲 98%。

糾正措施

通過刪除下列所有文件中的數據來增加可用磁碟空間：

- 原始數據文件
- 導出文件
- 檢體結果（使用 Customize（自定義）、System Setup（系統設置）、Tools Modify（修改工具）、End of Day（工作結束）)
- 日誌：消息日誌、維修日誌、用戶記事簿、試劑日誌、工作量日誌

重要訊息

刪除文件會永久性地擦除文件。如果需要數據的電子副本，請在刪除前備份或導出文件。

2

20 PSI Out of Range（20 PSI 超出範圍）

系統壓力超出範圍：

可能原因	糾正措施
1 PSI 壓力計超出範圍	檢查 20 PSI 壓力計，必要時調整調節器。 設定點：20 PSI ± 1
2 壓力泄漏	檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。

20 PSI Out of Range – Stop（20 PSI 超出範圍一停止）

系統壓力超出範圍：由於壓力已達到極限水平，可能會影響採樣結果的可靠性並損壞分析儀，所以分析儀已停止。

可能原因	糾正措施
1 PSI 壓力計超出範圍	檢查 20 PSI 壓力計，必要時調整調節器。 設定點：20 PSI ± 1
2 壓力泄漏	檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。

重要訊息
如果問題仍然出現，請致電 Siemens Service 以獲得幫助。只能由 Siemens 公司的維修人員執行進一步的糾正措施。

4

4 Key Not Found（4 個鍵未找到）

Control Dictionary（質控目錄）或 Alarm Dictionary（警示目錄）爲空。如果 Alarm Dictionary（警示目錄）爲空，則檢體／系統警示顯示爲驚嘆號(!)。

可能原因	糾正措施
1 Data Manager（數據管理器）收到的檢體標識爲一個質控品，但在 **Control Dictionary（質控目錄）**中未設置。	不要使用檢體上的質控品 ID 標籤，或者在 **Control Dictionary（質控目錄）**中設置該質控品。
2 **Alarm Dictionary（警示目錄）**爲空或缺少 Delta Check（增量檢查）警示。即使不使用增量檢查，**Alarm Dictionary（警示目錄）**中也必須包含 Delta Check（增量檢查）警示。	在 **Alarm oictionary（警示目錄）**中輸入警示。

4 個鍵未找到一 TestDic.dat – ReadTestCode_08

數據庫中的部分檢體包含已從 Test Dictionary（項目目錄）中刪除的測試。

糾正措施

在 Order Entry（工作指令）窗口中，刪除這些檢體以避免該錯誤。當檢體仍然包含在數據庫中時，不要修改 Test Dictionary（項目目錄）。

40 PSI Out of Range（40 PSI 超出範圍）

系統壓力超出範圍：

可能原因	糾正措施
1 40 PSI 壓力計超出範圍	檢查 40 PSI 壓力計，必要時調整調節器。設定點：40 PSI ± 2
2 壓力泄漏	檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。

40 PSI Out of Range – Stop（40 PSI 超出範圍一停止）

系統壓力超出範圍：由於壓力已達到極限水平，可能會影響採樣結果的可靠性並損壞分析儀，所以分析儀已停止。

可能原因	糾正措施
1 40 PSI 壓力計超出範圍	檢查 40 PSI 壓力計，必要時調整調節器。設定點：40 PSI ± 2
2 壓力泄漏	檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。

重要訊息

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。只能由 Siemens 公司的維修人員執行進一步的糾正措施。

5

5 PSI Out of Range（5 PSI 超出範圍）

系統壓力超出範圍：

可能原因	糾正措施
1 5 PSI 壓力計超出範圍	檢查 5 PSI 壓力計，必要時調整調節器。 設定點：5 PSI ± 5
2 壓力泄漏	檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。

5 PSI Out of Range – Stop（5 PSI 超出範圍一停止）

系統壓力超出範圍：由於壓力已達到極限水平，可能會影響採樣結果的可靠性並損壞分析儀，所以分析儀已停止。

可能原因	糾正措施
1 5 PSI 壓力計超出範圍	檢查 5PSI 壓力計，必要時調整調節器。 設定點：5 PSI ± 5
2 壓力泄漏	檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。

重要訊息

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。只能由 Siemens 公司的維修人員執行進一步的糾正措施。

8

80 Conflict（80 衝突）

由於兩個不同任務（例如，Review and Edit（檢查並編輯）和 Host Communication（主機通信））訪問一個檢體而發生衝突，或者您試圖在 Data Manager（數據管理器）訪問一個檢體的同時也訪問該檢體而導致衝突。

糾正措施

請稍候，幾秒鐘後再訪問該檢體。

9

9 End of File（9 文件結束）

Control Dictionary（質控目錄）爲空。無法操作 Quality Control（品質管制）。

糾正措施

在 Control Dictionary（質控目錄）窗口中定義至少一個 QC 文件。

A

A Defined File in Prg.par Is Not Found for Backup（在 Prg.par 中未找到要備份的已定義文件）

通過 End of Day（工作結束）功能運行程序備份時，要保存的列表或程序中定義的一個文件丟失。

糾正措施

致電 Siemens Service 以獲得幫助。

Analyzer Connected（已連接分析儀）

計算機已經與分析儀連接。

Analyzer Not Connected（尚未連接分析儀）

計算機尚未與分析儀連接。

可能原因	糾正措施
1 分析儀未啓動。	在分析儀觸控板上選擇 On（開）。
2 乙太網電纜存在故障或已斷開（從分析儀－J2 工作站連接到計算機）。	檢查乙太網電纜的連接是否牢固。必要時重新連接電纜。
3 分析儀的 CPU 電路板或網絡接口電路板存在故障。	致電 Siemens Service 以獲得幫助。

Analyzer Not Ready（分析儀未就緒）

分析儀無法開始檢體吸取或液路循環。

可能原因	糾正措施
1 鞘濟沖洗滿試劑容器爲空。	更換鞘液／沖洗液試劑。
2 廢液容器已滿。	清空廢液容器。
3 壓力或真空度超出範圍。	a 確認真空度和壓力讀數在範圍之內。必要時進行調整。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。

Analyzer Reset Required（需要重置分析儀）

發生嚴重系統故障，需要重置分析儀。

可能原因	糾正措施
與至少一個下列組件有關的潛在硬件故障：發動機節點、壓力節點、並行節點、開關指示器或選擇器閥	1 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 2 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 a 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 b 在分析儀觸控板上選擇 **Off（關）**。 c 選擇 CTRL+ALT+DELETE ，然後重新登錄到系統以便重新啓動軟體。 d 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。

Analyzer/Computer Not Connected（分析儀／計算機未連接）

分析儀與計算機之間的通信已中斷。

可能原因	糾正措施
1 分析儀發生電源故障。	在分析儀觸控板上選擇 Off（關），確認已牢固地連接電源插頭。必要時重新連接，然後在分析儀觸控板上選擇 On（開）。
2 乙太網電纜存在故障或已斷開（從分析儀一 J2 工作站連接到計算機）。	檢查乙太網電纜的連接是否牢固。必要時重新連接電纜。
3 計算機網絡配置已被破壞。	按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 **a** 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 **b** 在分析儀觸控板上選擇 **Off（關）**。 **c** 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 **d** 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。 **e** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Anisocytosis - Alarm（紅血球大小不均－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Anisocytosis - Stop（紅血球大小不均一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Aspiration Failed - Probe Clog - Alarm（吸取失敗一探針堵塞一警示）

導電檢測器在 20 秒吸取時間內未檢測到檢體。連續出現此情況的次數已符合爲警示消息設置的標準。

	可能原因	糾正措施
1	檢體凝結。	檢查檢體是否凝結。
2	檢體容量不足。可能在吸取完成之前已取下檢體試管。	重新吸取檢體。
3	真空度不足。	檢查真空計，必要時進行調節。
4	凝塊過濾器。	取下凝塊過濾器，將其作爲存在生物危害的物品廢棄。更換凝塊過濾器。
5	檢體管連接鬆動。	檢查連接，必要時擰緊連接。
6	針中出現凝塊。	對針進行沖洗。選擇 **Utilities（工具）**菜單、**Hydraulic Functions（液路功能）**選項、**Needle Rinse（針沖洗）**。
7	針彎曲或已損壞。	更換針。按照”更換進樣器針”中的步驟操作。
8	導電檢測器存在故障。	請與 Siemens Field Service 代表聯繫以獲得幫助。

Aspiration Failed - Probe Clog - Stop（吸取失敗一探針堵塞一停止）

導電檢測器在 20 秒吸取時間內未檢測到檢體。連續出現此情況的次數已符合爲停止消息設置的標準。

	可能原因	糾正措施
1	檢體凝結。	檢查檢體是否凝結。
2	檢體容量不足。在吸取完成之前已取下檢體試管。	可能重新吸取檢體。
3	真空度不足。	檢查真空計，必要時進行調節。
4	凝塊過濾器。	取下凝塊過濾器，將其作爲存在生物危害的物品廢棄。更換凝塊過濾器。
5	檢體管連接鬆動。	檢查連接，必要時擰緊連接。
6	針中出現凝塊。	對針進行沖洗。選擇 **Utilities（工具）**菜單、**Hydraulic Functions（液路功能）**選項、**Needle Rinse（針沖洗）**。
7	針彎曲或已損壞。	更換針。按照**更換進樣器針**中的步驟操作。

8	導電檢測器存在故障。	請與 Siemens Field Service 代表聯繫以獲得幫助。

Aspiration Paused（吸取已暫停）

打開某些菜單或選項，或者觸發某些錯誤消息時，分析儀無法執行檢體吸取或開始液路循環。同樣，指示可開始吸取的綠色燈不會亮起。

可能原因		糾正措施
1	選擇下列菜單或選項時會暫停吸取：**Reagent Installation（試劑安裝）**、**Backup/Restore（備份／恢復）**、**System Setup（系統設置）**、**Tools Modify（修改工具）**，或者在觸發某些錯誤消息時。	選擇左側的 Possible Cause（可能原因）下列出的項以外的任意選項或菜單按鈕。
2	發生嚴重系統錯誤，會將當前系統狀態轉換爲 Aspiration Paused（吸取已暫停）。	有關適當的糾正措施步驟，請參考相關的錯誤消息。

Atypical Lymphocytes - Alarm（異形淋巴細胞一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Atypical Lymphocytes - Stop（異形淋巴細胞一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Auto Rinse - Started（自動沖洗一已開始）

Auto Rinse（自動沖洗）已按設定時間開始。

Auto Rinse Canceled（已取消自動沖洗）

系統已根據用戶的取消要求，取消計劃的 Auto Rinse（自動沖洗）。

Auto Rinse Missed（已錯過自動沖洗）

當 Exerciser（執行）或 System Setup（系統設置）選項打開時，會錯過計劃的 Auto Rinse（自動沖洗），不會執行該操作。

Auto Standby - Started（自動待機一已啓動）

Auto Standby（自動待機）已按期啓動。

Auto Standby Canceled（已取消自動待機）

系統已根據用戶的取消要求，取消計劃的 Auto Standby（自動待機）。

Auto Standby Missed（已錯過自動待機）

當 Exerciser（執行）或 System Setup（系統設置）選項打開時，會錯過計劃的 Auto Standby（自動待機）。

Auto Startup - Exiting Standby（自動啓動一正在退出待機模式）

系統從 Standby（待機）切換到 Ready-to-Run（做好運行準備），以便按計劃進行 Auto Startup（自動啓動）。

Auto Startup - Started（自動啓動一已開始）

已經按計劃開始 Auto Startup（自動啓動）。

Auto Startup Canceled（已取消自動後動）

系統已根據用戶的取消要求，取消計劃的 Auto Startup（自動啓動）。

Auto Startup is Due - Will Start at End of Run （到達自動啓動時間一將在運行結束吋開始）

計劃的 Auto Startup（自動啓動）將在檢體處理或液路循環結束時開始。

Auto Startup Missed（已錯過自動啓動）

當 Exerciser（執行）或 System Setup（系統設置）選項打開時，會錯過計劃的 Auto Startup（自動啓動），不會執行該操作。

Auto System Wash - Exiting Standby（自動系統清洗—正在退出待機模式）

系統從 Standby（待機）切換到 Ready-to-Run（做好運行準備），以便按計劃進行 Auto System Wash（自動系統清洗）

Auto System Wash Canceled（已取消自動系統清洗）

系統已根據用戶的取消要求，取消計劃的 Auto System Wash（自動系統清洗）。

Auto Wash - Started（自動清洗—已開始）

Auto System Wash（自動系統清洗）按計劃開始。

Auto Wash is Due - Will Start at End of Run（到達自動清洗時間—將在運行結束時開始）

計劃的 Auto System Wash（自動系統清洗）將在檢體處理或液路循環結束時開始。

Auto Wash Missed（已錯過自動清洗）

當 Exerciser（執行）或 System Setup（系統設置）選項打開時，會錯過計劃的 Auto System wash（自動系統清洗），不會執行該操作。

AutoRETIC Reagent Empty – Stop（AutoRETIC 試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已中止。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

AutoRETIC Reagent Expired（AutoRETIC 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和開封容器的穩定性來計算，當前日期已超出 AutoRETIC 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

AutoRETIC Reagent Low – Alarm（AutoRETIC 試劑過少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 ReagentInstallation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

Autosampler - Access Door Open（自動進樣器—檢修門打開）

自動進樣器檢修門打開（24V 互鎖開關打開）。

糾正措施

1. 關閉自動進樣器檢修門。自動進樣器會重置。
2. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Autosampler is Already Running（自動進樣器—自動進樣器已在運行）

自動進樣器在運行時收到一條開始或彈出樣品架的命令。

Autosampler - Bad Mixer Aspiration Cal（自動進樣器－

在診斷模式下混和器吸取校正失敗（Exerciser（執行）選項）。



警示

致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有權執行上述糾正措施。

可能原因	糾正措施
1 自動進樣器校正錯誤。	再次校正混和器吸取位置。
2 自動進樣器 CPU 電路板無法在閃存中存儲校正數據。	更換自動進樣器 CPU 電路板。

Autosampler - Bad Mixer Shuttle Cal（自動進樣器一混和器傳送校正不正確）

在診斷模式下混和器容器／指針校正失敗（Exerciser（執行）選項）。



警示

致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有權執行上述糾正措施。

可能原因	糾正措施
1 自動進樣器校正錯誤。	再次校正混和器容器／指針。
2 自動進樣器 CPU 電路板無法在閃存中存儲校正數據。	更換自動進樣器 CPU 電路板。

Autosampler - Calibration Requried（自動進樣器一需要校正）

要啓動分析儀，必須在閃存中存儲 Car Index 位置、Mixer Shuttle 位置和 Mixer Aspirate 位置的初次校正值。



警示

致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有權執行上述糾正措施。

可能原因	糾正措施
1 自動進樣器的 CPU 電路板包含新的未編程閃存。	使用 Exerciser（執行）選項，校正 **Car Index（指針）**位置、**Mixer-Shuttle（混和器區）**位置和 **Mixer-Aspirate（混和器吸取）**位置。

2 閃存已丟失存儲的值。

使用 Exerciser（執行）選項，校正 **Car Index（指針）**位置、**Mixer-Shuttle（混和器區）**位置和 **Mixer-Aspirate（混和器吸取）**位置。

Autosampler - Car Alignment Error, Reset Autosampler（自動進樣器一校正錯誤，重置自動進樣器）

自動進樣器未校正。需要重置。

糾正措施

1 打開自動進樣器檢修門。

2 關閉自動進樣器檢修門。自動進樣器會重置。

3 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Car Initialization Failed, Reset Autosampler（自動進樣器一初始化失敗，重置自動進樣器）

自動進樣器的正常初始化已失敗。需要重置。

糾正措施

1 打開自動進樣器檢修門。

2 關閉自動進樣器檢修門。自動進樣器將重置。

3 如果問題仍然出現，按下分析儀觸控板上的 **Off（關）**按鈕。

4 等待約 1 分鐘，然後按下 **On（開）**按鈕以重新啓動分析儀。

5 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Car Lost Steps, Reset Autosampler（自動進樣器—丟失步驟，重置自動進樣器）

自動進樣器未處於預期位置。需要重置。

可能原因	糾正措施
1 移動問題。	a 在自動進樣器觸控板上，選擇 **Off（關）**。 b 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 c 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 如果反複出現移動問題，會導致過於緊綳且樣品架上的拖力過大。	**警示** 致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有權執行上述糾正措施。 a 使用 **Exerciser（執行）**選項的 Autosampler（自動進樣器）窗口，將混和器移至 Home（初始）位置。 b 手動將樣品架從入架區通過混和器移至出架區。在移動樣品架時，檢查是否過於緊綳和拖力是否過大。 c 必要時執行混和器校正過程。

Autosampler - Car Motion Denied（自動進樣器—移動已被拒絕）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行移動自動進樣器的命令。

Autosampler - Car Motion Denied, Reset Autosampler（自動進樣器－移動已被拒絕，重置自動進樣器）

自動進樣器試圖執行不適當的移動。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Car Motion Failed, Reset Autosampler（自動進樣器—移動失敗，重置自動進樣器）

自動進樣器無法適當地移動。需要重置。

糾正措施

1. 打開自動進樣器檢修門。
2. 關閉自動進樣器檢修門。自動進樣器會重置。
3. 如果問題仍然出現，請在分析儀觸控板上選擇 **Off（關）**。
4. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
5. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Centering Collar Extend Denied（自動進樣器—伸出定心環已被拒絕）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行伸出自動進樣器定心環的命令。

Autosampler - Centering Collar Failed to Extend, Reset Autosampler（自動進樣器—無法伸出定心環，重置自動進樣器）

無法正確伸出自動進樣器的定心環。

可能原因	糾正措施
1 嚴重進樣器錯誤需要部分重置。	a 打開自動進樣器檢修門。 b 關閉自動進樣器檢修門。自動進樣器將重置。
2 嚴重進樣器錯誤需要完全重置。	a 在分析儀的觸控板上，選擇 **Off（關）**。 b 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 c 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 爲定心環供應空氣的管道被擠壓。	a 打開自動進樣器檢修門。 b 檢查扭結或擠壓的管線。必要時重新連接電纜。 c 關閉自動進樣器檢修門。自動進樣器將重置。 d 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
4 輸出隊列傳感器或線路存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Centering Collar Failed to Retract, Reset Autosampler（自動進樣器—無法縮回定心環，重置自動進樣器）

無法正常縮回自動進樣器的定心環。

可能原因	糾正措施
1 嚴重進樣器錯誤需要部分重置。	**a** 打開自動進樣器檢修門。 **b** 關閉自動進樣器檢修門。自動進樣器將重置。
2 嚴重進樣器錯誤需要完全重置。	**a** 在分析儀的觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 爲定心環供應空氣的管道被擠壓。	**a** 打開自動進樣器檢修門。 **b** 檢查扭結或擠壓的管線。必要時重新連接電纜。 **c** 關閉自動進樣器檢修門。自動進樣器將重置。 **d** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
4 輸出隊列傳感器或傳感器線路存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Collar Failed to Extend, Reset Autosampler（自動進樣器—無法伸出定心環，重置自動進樣器）

無法正常伸出自動進樣器的定心環。

可能原因	糾正措施
1 嚴重進樣器錯誤需要部分重置。	**a** 打開自動進樣器檢修門。 **b** 關閉自動進樣器檢修門。自動進樣器將重置。
2 嚴重進樣器錯誤需要完全重置。	**a** 在分析儀的觸控板上，選擇 Off（關）。 **b** 等待約 1 分鐘，然後選擇 On（開）以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 爲定心環供應空氣的管道被擠壓。	**a** 打開自動進樣器檢修門。 **b** 檢查扭結或擠壓的管線。必要時重新連接電纜。 **c** 關閉自動進樣器檢修門。自動進樣器將重置。 **d** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
4 輸出隊列傳感器或線路存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Collar Failed to Retract, Reset Autosampler（自動進樣器—無法縮回定心環，重置自動進樣器）

無法正常縮回自動進樣器的定心環。

可能原因	糾正措施
1 嚴重進樣器錯誤需要部分重置。	**a** 打開自動進樣器檢修門。 **b** 關閉自動進樣器檢修門。自動進樣器將重置。
2 嚴重進樣器錯誤需要完全重置。	**a** 在分析儀的觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 爲定心環供應空氣的管道被擠壓。	**a** 打開自動進樣器檢修門。 **b** 檢查扭結或擠壓的管線。必要時重新連接電纜。 **c** 關閉自動進樣器檢修門。自動進樣器將重置。 **d** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
4 輸出隊列傳感器或線路存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Centering Collar Motion Denied, ResetAutosampler（自動進樣器—移動定心環被拒絕，重置自動進樣器）

自動進樣器試圖不適當地移動定心環。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Centering Collar Retract Denied（自動進樣器—縮回定心環已被拒絕）

爲防止自動進樣器的各個組件相互而系統不會執行縮回自動進樣器定心環的命令。

Autosampler - Critical Error, Reset Autosampler（自動進樣器一嚴重錯誤，重置自動進樣器）

嚴重自動進樣器錯誤。需要重置。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Diagnostic Mode Not In Effect（自動進樣器一診斷模式不生效）

分析儀在自動進樣器處於運行模式下時間其發送了一個診斷命令。

糾正措施

1. 打開 Exerciser（執行）選項的 **Autosampler（自動進樣器）**窗口
2. 選擇 **Enter oiagnostic Mode（進入診斷模式）**。

Autosampler - Eject Rack Failed（自動進樣器一彈出樣品架失敗）

自動進樣器無法響應彈出樣品架的命令，而且不會從混和器以及入架區和出架區中清除樣品架。

可能原因	糾正措施
1 自動進樣器沒有接收到來自分析模組的命令。	a 在分析儀觸控板上，選擇 **Off（關）**。 b 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 c 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 自動進樣器與分析儀之間的所有通信可能都已中斷。	請參見 **1a、b、c**
3 自動進樣器操作可能中斷。	請參見 **1a、b、c**

Autosampler Error - Reason Unknown（自動進樣器錯誤—未知原因）

未知的自動進樣器軟體錯誤。

糾正措施

1. 在分析儀的觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Error, Reset Autosampler（自動進樣器—錯誤，重置自動進樣器）

自動進樣器遇到軟體錯誤，必須將其重置。

糾正措施

1. 在分析儀的觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Extra Rack Ejected（自動進樣器—彈出額外的樣品架）

本消息儀供您參考。如果該消息仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler Failure - Stop（自動進樣器故障—停止）

存在自動進樣器通信錯誤。需要重置。

糾正措施

1. 在分析儀觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Flash Memory Failed, Reset Autosampler（自動進樣器—內存失敗，重置自動進樣器）

自動進樣器的閃存無法響應一個例行命令，可能存在缺陷。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Initialization Requried（自動進樣器—需要初始化）

在診斷模式下，分析儀在執行適當初始化之前發送了一個位置命令。例如，可能在混和器初始化之前發送了一個位置混和器命令。

糾正措施

致電 Siemens Service 以獲得幫助。

Autosampler - Input Queue Jammed（自動進樣器—輸入區阻塞）

可能原因	糾正措施
1 樣品架堵住了入架隊列片的前導邊。	取下並重置樣品架。
2 等待區移動受阻。	檢查入架等待區中是否存在異物。
3 輸入馬達失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Input Queue Motion Denied（自動進樣器—輸入區的移動被拒絕）

爲防止自動進樣器的各個組件相互而系統不會執行移動自動進樣器輸入區的命令。

Autosampler - Input Queue Motion Denied, Reset Autosampler（自動進樣器—輸入區的移動被拒絕，重置自動進樣器）

自動進樣器試圖執行不適當的輸入區移動。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Input Queue Motion Failed（自動進樣器一輸入區移動失敗）

自動進樣器的輸入區無法正確移動。

可能原因	糾正措施
1 樣品架堵住了輸入隊列片的前導邊。	a 取下並更換樣品架。 b 在分析儀觸控板上選擇 **Start（開始）**自動進樣器會恢復運行。
2 等待區無法正常移動。	檢查等待區中是否存在異物。
3 輸入馬達失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Input Queue Motion Failed, Reset Autosampler（自動進樣器一輸入區的移動故障，重置自動進樣器）

自動進樣器的輸入區無法正確移動。需要重置自動進樣器。

可能原因	糾正措施
1 樣品架堵住了輸入隊列片的前導邊。	a 取下並更換樣品架。 b 在分析儀觸控板上選擇 start（開始）自動進樣器會恢復運行。 如果自動進樣器未啓動： a 在分析儀觸控板上選擇 Off（關）。 b 等待約 1 分鐘，然後選擇 On（開）以重新啓動分析儀。 c 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 等待區無法正常移動。	檢查等待區中是否存在異物。
3 輸入馬達失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Input Shuttle Blocked（自動進樣器一入架區堵塞）

入架區位置的一個樣品架導致自動進樣器無法移動。

糾正措施

1. 從輸入區前端的入架區位置取出樣品架。
2. 在分析儀觸控板上選擇 **Start（開始）**以重新開始自動進樣器操作。

Autosampler - Input Shuttle Not Empty（自動進樣器—入架區非空）

入架區位置的一個樣品架導致自動進樣器無法移動。

糾正措施

1. 從輸入區前端的入架區位置取出樣品架。
2. 在分析儀觸控板上選擇 **Start（開始）**以重新開始自動進樣器操作。

Autosampler - Internal Communication Failure（自動進樣器—內部通信故障）

在正常操作過程中，自動進樣器檢測到內部的軟體級通信故障。這會導致自動進樣器停止運行。

糾正措施

1. 在分析儀觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Invalid Operation Mode, Reset Autosampler（自動進樣器—無效運行模式，重置自動進樣器）

自動進樣器無法執行請求的移動。自動進樣器可能未處於正確模式下。

糾正措施

1. 在分析儀觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Invalid Sequence Number（自動進樣器一無效序列號）

自動進樣器向分析儀發送的檢體 ID 序列號與預期的序列號不符。

可能原因	糾正措施
1 自動進樣器執行了兩個指針操作，但未進行吸取。	**a** 在分析儀觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 自動進樣器向分析儀發送的消息不包含當前樣品架位置的試管預期的檢體 ID 序列號。	請參見 **1a、b、c**

Autosampler - Mechanical Constraint（自動進樣器一機械限制）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行請求的操作。

Autosampler - Mixer Failed（自動進樣器一混和器失敗）

自動進樣器混和器失敗，可能存在缺陷。

糾正措施

1. 在分析儀觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Mixer Lost Steps, Reset Autosampler（自動進樣器一混和器丟失步驟，重置自動進樣器）

自動進樣器混合器未處於預期位置。需要重置。

可能原因	糾正措施
1 移動問題。	**a** 在分析儀觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

2	如果反複出現移動問題，會導致過於緊綳且樣品架上的拖力過大。	 ***警示*** ***致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有權執行上述糾正措施。*** **a** 必要時執行混和器校正過程。 **b** 當混合器處於吸取位置時，檢查推針和定心環的操作。 **c** 檢查混合器軸承是否存在這度摩擦的邇象。

Autosampler - Mixer Motion Denied, ResetAutosampler（自動進樣器—混合器移動已被拒絕，重置自動進樣器）

自動進樣器試圖執行不適當的混合器移動。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Mixer Motion Failed, Reset Autosampler（自動進樣器－混合器移動失敗，重置自動進樣器）

自動進樣器不能在正常處理樣品架的過程中執行常規混合器移動。需要重置。

可能原因	糾正措施
1 嚴重自動進樣器錯誤。	**a** 在分析儀的觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 混合器被異物阻塞。	**a** 打開自動進樣器檢修門。 **b** 取出可能阻塞混合器移動的所有異物。 **c** 關閉自動進樣器檢修門。自動進樣器將重置。
3 混合器主傳感器存在故障。	致電 Siemens Service 以獲得幫助。
4 混合器發動機電源線沒有正確連接或存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Mode of Operation Not Set（自動進樣器—未設置運行模式）

自動進樣器無法在系統處於 Exerciser（執行）選項時執行請求的移動。

糾正措施

在 Exerciser（執行）選項上，將自動進樣器設置爲與要執行的操作對應的正確模式。要繼續操作，可能必須重置自動進樣器。

要重置自動進樣器

1. 在分析儀觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Motion Denied, Reset Autosampler（自動進樣器—移動已被拒絕，重置自動進樣器）

自動進樣器無法執行移動命令，必須將其重置。

糾正措施

1. 在分析儀觸控板上，選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Motion Request Failed, Reset Autosampler（自動進樣器—移動請求失敗，重置自動進樣器）

自動進樣器無法執行請求的移動，可能存在缺陷。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Motor Controller Failed, Reset Autosampler（自動進樣器－發幼機控制器失敗，重置自動進樣器）

自動進樣器發動機控制器無法響應一個例行命令，可能存在缺陷。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Needle Extend Denied（自動進樣器—針伸出被拒絕）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行伸出自動進樣器針的命令。

Autosampler - Needle Failed to Extend, Reset Autosampler（自動進樣器—針無法伸出，重置自動進樣器）

自動進樣器的針無法正常伸出。

可能原因	糾正措施
1 嚴重進樣器錯誤。	a 打開自動進樣器檢修門。 b 關閉自動進樣器檢修門。自動進樣器將重置。 c 如果問題仍然出現，請在分析儀觸控板上選擇 **Off（關）**。 d 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 e 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 40 PSI 管超出範圍。	a 檢查壓力，必要時進行調節。 b 檢查供應針氣缸的空氣管是否被擠壓。 c 在分析儀觸控板上，選擇 **Off（關）**。 d 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 e 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 針已彎曲。	更換針。
4 針傳感器失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Needle Failed to Retract, Reset Autosampler（自動進樣器—無法縮回針，重置自動進樣器）

自動進樣器的針無法正常縮回。

可能原因	糾正措施
1 嚴重進樣器錯誤。	**a** 打開自動進樣器檢修門。 **b** 關閉自動進樣器檢修門。自動進樣器將重置。 **c** 如果問題仍然出現，請在分析儀觸控板上選擇 **Off（關）**。 **d** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **e** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 40 PSI 管超出範圍。	**a** 檢查壓力，必要時進行調節。 **b** 檢查供應針氣缸的空氣管是否被擠壓。 **c** 在分析儀觸控板上，選擇 **Off（關）**。 **d** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **e** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 針已彎曲。	更換針。
4 針傳感器失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Needle Jammed（自動進樣器—針塞滿）

由於吸取檢體，無法伸出或縮回針。

可能原因	糾正措施
1 40 PSI 管超出範圍。	**a** 檢查壓力，必要時進行調節。 **b** 檢查供應針氣缸的空氣管是否被擠壓。 **c** 在分析儀觸控板上，選擇 **Off（關）**。 **d** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **e** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 針傳感器失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Needle Motion Denied, Reset Autosampler（自動進樣器－針移動已被拒絕，重置自動進樣器）

自動進樣器試圖執行不適當的針移動。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Needle Retract Denied（自動進樣器—針縮回被拒絕）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行縮回自動進樣器針的命令。

Autosampler - No Tube Present（自動進樣器—沒有試管）

推針在當前樣品架位置找不到試管。樣品架的彈簧夾斷開，不能以正確方式固定試管。

糾正措施

取下樣品架，檢查夾子。

Autosampler - Operating Mode Not in Effect（自動進樣器—運行模式不生效）

自動進樣器未處於運行模式。

糾正措施

1. 打開 Exerciser（執行）選項的 **Autosampler（自動進樣器）**窗口。
2. 打開其他選項，退出 **Exerciser（執行）**選項。

Autosampler - Output Queue Full（自動進樣器—輸出隊列已滿）

可能原因	糾正措施
1 輸出隊列和／或出架區已滿。	從輸出隊列和／或出架區中取下樣品架。
2 輸出隊列傳感器、色帶電纜或自動進樣器的 CPU 電路板存在故障。	 **警示** 致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有權執行上述糾正措施： **a** 檢查輸出隊列傳感器及傳感器電纜。 **b** 確保按下輸出隊列傳感器警示會觸發傳感器。 **c** 確保已緊緊插入輸出隊列色帶。 **d** 更換自動進樣器 CPU 電路板。

Autosampler - Output Queue Jammed（自動進樣器—輸出馱列阻塞）

輸出隊列阻塞。

可能原因	糾正措施
1 輸出等待區的前導邊會刺向樣品架。	從輸出隊列和／或出架區中取下樣品架。
2 輸出隊列的移動受阻。	**a** 檢查輸出隊列、隊列蓋或擠壓防護器中是否有異物。 **b** 確保輸出隊列可自由移動。
3 饋送發動機故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Output Queue Motion Denied（自動進樣器—輸出隊列的移動被拒絕）

爲防止自動進樣器的各個組件相互碰撞，出隊列的命令。系統不會執行移動自動進樣器輸

Autosampler - Output Queue Motion Failed（自動進樣器—輸出隊列移動失敗）

自動進樣器的輸出隊列無法正常移動。

可能原因	糾正措施
1 輸出隊列盤的前導邊會刺向樣品架。	**a** 輸出隊列和／或區中取下樣品架。 **b** 在分析儀觸控板上選擇 **Start（開始）**。自動進樣器會恢復運行。
2 隊列無法正常移動。	檢查輸出隊列、隊列蓋和擠壓防護器中是否存在異物。確保隊列可自由移動。
3 輸入馬達失敗。	致電 Siemens Service 以獲得幫助。

Autosampler - Output shuttle Blocked（自動進樣器—出架區堵塞）

出架區位置的一個樣品架導致自動進樣器無法移動。

糾正措施

a 從輸出隊列前端的區位置取出樣品架。

b 在分析儀觸控板上選擇 **Start（開始）**以重新開始自動進樣器操作。

Autosampler - Output Shuttle Failed（自動進樣器—出架區失敗）

出架區完成移動後，出架區位置沒有樣品架。原因可能是用戶已在區停止前將樣品架取出。

Autosampler - Output Shuttle Not Empty（自動進樣器—出架區非空）

自動進樣器試圖將樣品架移至出架區，但該區不爲空。

糾正措施

從出架區中取出樣品架。

Autosampler - Pushpin Extend Denied（自動進樣器—推針伸出被拒絕）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行伸出自動進樣器推針的命令。

Autosampler - Pushpin Motion Denied, Reset Autosampler（自動進樣器—推針移動已被拒絕，重置自動進樣器）

自動進樣器試圖執行不適當的推針移動。需要重置自動進樣器。

糾正措施

1. 在分析儀觸控板上選擇 **Off（關）**。
2. 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Pushpin Retract Denied（自動進樣器—推針縮回被拒絕）

爲防止自動進樣器的各個組件相互碰撞，系統不會執行縮回自動進樣器推針的命令。

Autosampler - Pushpin Failed to Extend, Reset Autosampler（自動進樣器—推針無法伸出，重置自動進樣器）

自動進樣器的推針無法正常伸出。

可能原因	糾正措施
1 推針已被阻塞。	a 打開自動進樣器檢修門。 b 關閉自動進樣器檢修門。自動進樣器將重置。 c 如果問題仍然出現，請在分析儀觸控板上選擇 **Off（關）**。 d 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 e 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 推針與未放在正確位置的樣品架底部接觸。	a 檢查混合器中的樣品架位置。必要時進行調整。 b 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 推針與混合器的底部接觸。	a 檢查混合器中的樣品架位置。必要時進行調整。 b 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

4	輸出隊列傳感器或線路存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Pushpin Failed to Retract, Reset Autosampler（自動進樣器—無法縮回推針，重置自動進樣器）

自動進樣器的推針無法正常縮回。

可能原因	糾正措施
1 推針已被阻塞。	**a** 打開自動進樣器檢修門。 **b** 關閉自動進樣器檢修門。自動進樣器將重置。 **c** 如果問題仍然出現，請在分析儀觸控板上選擇 **Off（關）**。 **d** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **e** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 推針與未放在正確位置的樣品架底部接觸。	**a** 檢查混合器中的樣品架位置。必要時進行調整。 **b** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 推針與混合器的底部接觸。	**a** 檢查混合器中的樣品架位置。必要時進行調整。 **b** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
4 輸出隊列傳感器或線路存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Pushpin Jammed（自動進樣器—推針阻塞）

推針已阻塞，無法正常伸出或縮回。

可能原因	糾正措施
1 推針與未放在正確位置的樣品架底部接觸。	**a** 檢查並調整混合器中樣品架的位置。  **警示** 致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有校執行該糾正措施。 **b** 檢查輸出隊列傳感器及傳感器電纜。
2 推針與混合器擠出的下表面接觸。	**a** 檢查並調整混合器中樣品架的位置。  **警示** 致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有校執行該糾正措施。 **b** 檢查輸出隊列傳感器及傳感器電纜。

Autosampler - Rack Index Failed, Reset Autosampler（自動進樣器—樣品架索引失敗，重置自動進樣器）

掃描儀讀取的有效條碼與預期的樣品架或位置編號不對應。這說明樣品架沒有移至正確位置。

可能原因	糾正措施
1 樣品架移動問題。	**a** 在分析儀觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 如果反複出現混合器問題，會導致過於緊繃且樣品架上的拖力過大。	 **警示** 致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有校執行該糾正措施。 **a** 使用 **Exerciser（執行）**選項的 Autosampler（自動進樣器）窗口，將混和器移至 Home（初始）位置。 **b** 手動將樣品架從入架區通過混和器移至出架區。在移動樣品架時，檢查是否過於緊繃和拖力是否過大。 **c** 必要時執行混和器校正過程。

Autosampler - Rack or Position Barcode Not Read（自動進樣器—未讀取樣品架或位置條碼）

條碼閱讀器無法爲當前試管位置確定有效的樣品架 ID 或位置編號。

可能原因	糾正措施
1 樣品架條碼標籤的位置不正確、模糊或不存在。	確保條碼標籤正確黏貼在樣品架上，清潔且符合規範。
2 條碼閱讀器的窗口較髒或光線被遮擋。	**a** 清潔條碼閱讀器的窗口。 **b** 確保條碼閱讀器窗口與樣品架之間沒有可見的遮擋物。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 條碼閱讀器存在故障。	致電 Siemens Service 以獲得幫助。

Autosampler - Rack Scan Denied（自動進樣器—樣品架扣描被拒絕）

條碼閱讀器無法掃描。

可能原因	糾正措施
1 條碼閱讀器的電纜存在故障。	**a** 在分析儀觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 條碼閱讀器存在故障。	請參見 **1a、b、c**
3 條碼閱讀器的窗口較髒或光線被遮擋。	**a** 清潔條碼閱讀器窗口。 **b** 確保條碼閱讀器窗口與樣品架之間沒有可見的遮擋物。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
4 樣品架條碼標籤的位置不正確、模糊或不存在。	確保條碼標籤正確黏貼在樣品架上，清潔且符合規範。

Autosampler - Rack Scan Failed（自動進樣器一樣品架掃描失敗）

條碼閱讀器無法掃描。

可能原因	糾正措施
1 條碼閱讀器的電纜存在故障。	a 在分析儀觸控板上，選擇 **Off（關）**。 b 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 c 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 條碼閱讀器存在故障。	請參見 **1a、b、c**

Autosampler - Shuttle Gate Open（自動進樣器一區門打開）

區門未關，導致輸入隊列無法前進到樣品架上。

可能原因	糾正措施
1 區門只能部分關閉。	a 檢查區門旁是否有障得物。 b 推動區門，檢查彈簧阻力。
2 傳感器或傳感器電纜存在故障。	 **警示** 致電 Siemens Service 以獲得幫助。只有 Siemens Service 的員工有校執行該糾正措施： 檢查傳感器和相關的電纜。

Autosampler - Startup Failed, Reset Autosampler（自動進樣器一啓動失敗，重置自動進樣器）

自動進樣器的啓動失敗。需要重置。

糾正措施

1. 打開自動進樣器檢修門。
2. 關閉自動進樣器檢修門。自動進樣器會重置。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Autosampler - Tube Too High（自動進樣器一試管過高）

樣品架上的試管過高或試管超出規格，導致自動進樣器停止。

可能原因	糾正措施
1 試管沒有正確放置。	a 向下推試管。 b 在分析儀觸控板上，選擇 **Star/Stop（開始／停止）**以繼續運行。
2 試管過長。	a 從樣品架上取下試管，進行手動吸取。 b 在分析儀觸控板上，選擇 **Start/Stop（開始／停止）**以繼續運行。

Autosampler Startup Complete（自動進樣器啟動完成）

自動進樣器已成功完成啓動過程。

Autosampler - Unexpected Car Position, Reset Autosampler（自動進樣器一以外位置，重置自動進樣器）

自動進樣器的位置不正確。需要重置。

糾正措施

1. 打開自動進樣器檢修門。
2. 關閉自動進樣器檢修門。自動進樣器會重置。
3. 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Awaiting Header（正在等待標題）

軟體通信錯誤。

可能原因	糾正措施
在下列分析周期中可能會發生該錯誤： • 調整 Gains - RBC/RETIC • 校正光學器件 • 直接校正光學器件	按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動： 1 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 2 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

B

R 消息的錯誤分析：10402

發送到主機的結果消息不正確。

糾正措施

致電 Siemens Service 以獲得幫助。

Y 消息的錯誤分析：10402

收到的工作指令的格式不正確。無法創建工作指令。

糾正措施

致電 Siemens Service 以獲得幫助。

Bad Mixer Cal Value - Reset Autosampler（錯誤混合器校正值一重置自動進樣器）

系統處於診斷模式時（Exerciser（執行）），混合器的吸取校正失敗。

只能由 Siemens Service 的員工執行該錯誤的糾正措施。

可能原因	糾正措施
1 自動進樣器校正錯誤	再次校正混合器的吸取位置。
2 自動進樣器的 CPU 電路板無法在閃存中存儲校正數據	更換自動進樣器 CPU 電路板。

配置文件中的測試錯誤

在配置文件中定義的測試代碼不正確。

糾正措施

使用 Table Dictionaries（表目錄）窗口中的 List（列表）菜單更正 Profile Table（配置文件表）。

BASO Count Suspect - Alarm（可疑 BASO 計數一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

BASO Count Suspect - Stop（可疑 BASO 計數一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

BASO Irregular Flow Rate – Alarm（BASO 流速異常－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

BASO Irregular Flow Rate – Stop（BASO 流速異常一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

BASO Reagent Empty – Stop（BASO 試劑空一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

BASO Reagent Expired（BASO 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 BASO 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Instsllation（試劑安裝）

BASO Reagent Low – Alarm（BASO 試劑過少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

BASO Saturation – Alarm（BASO 飽和區—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

BASO Saturation – Stop（BASO 飽和區—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

BASO Temperature Out – Alarm（BASO 溫度超出範圍—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

BASO Temperature Out – Stop（BASO 溫度超出範圍—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

Blasts – Alarm（Blasts－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Blasts – Stop（Blasts－停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

BTRIEVE - TabDic.dat File（BTRIEVE - TabDic.dat 文件）

Type Table Dictionary（圖表類型目錄）包含已刪除配置文件的代碼。

糾正措施

檢查並更正 Type Table Dictionary（圖表類型目錄）。選擇 Customize（自定義），System Setup（系統設置）、Tools Modify（修改工具）、Type Table Dictionary（圖表類型目錄）。

C

Car Motion Failed - Reset Autosampler（移動失敗－重置自動進樣器）

自動進樣器不能按預期方式移動。

可能原因	糾正措施
自動進樣器軟體錯誤	1 在分析儀觸控板上，選擇 **Off（關）**。 2 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 3 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Check Waste Container Vacushield（檢查廢液容器通叔過濾器）

廢液容器上的真空泵過濾器（通氣過濾器）可能已充滿液體。

可能原因	糾正措施
1 真空泵過濾器（通氣過濾器）阻塞。	更換真空泵過濾器。
2 真空泄漏	a 檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。 b 檢查廢液容器，確保龍頭已關閉且蓋子已蓋好。
3 廢液管卷曲	檢查廢液容器上的廢液管是否卷曲。必要時拉直或重新連接相應管道。

重要訊息

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。只能由 Siemens 公司的維修人員執行進一步的糾正措施。

Communications Error with Analyzer（與分析儀的通信錯誤）

計算機與分析儀之間的軟體通信錯誤。

可能原因	糾正措施
1 內部軟體中斷	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。

2	乙太網電纜存在故障或已斷開（從分析儀一 J2 工作站連接到計算機）	檢查乙太網連接是否牢固。必要時重新連接電纜。

Comparison Error MCHC/CHCM - Alarm（比較錯誤 MCHC/CHCM－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Comparison Error MCHC/CHCM - Stop（比較錯誤 MCHC/CHCM－停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Comparison Error WBCB/WBCP - Alarm（比較錯誤 WBCB/WBCP－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

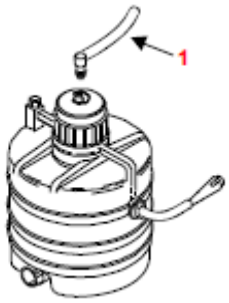
Comparison Error WBCB/WBCP - Stop（比較錯誤 WBCB/WBCP－停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Compressor Timeout（壓縮機超時）

在啓動系統或退出待機模式的過程中，壓縮機無法在分配的時間內達到可接受的壓力或真空度。

可能原因	糾正措施
1 關閉系統後過早地重新啓動	斷開廢液容器真空管(1)系統。給廢液容器手動通氣，等真空狀態解除後再重新接上。
2 連接到廢液容器的真空管已斷開或卷曲。	**a** 重新連接廢液容器真空管或展開每一段卷曲的管。 **b** 在分析儀的觸控板上，選擇 **Off（關）**。 **c** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。
3 真空泵過濾器（通氣過濾器）阻塞。	更換真空泵過濾器。
4 壓縮機故障。	致電 Siemens Service 以獲得幫助。



Control Out of Range - Alarm（質控超出範圍一警示）

一個或多個質控品檢體產生超出範圍的測試結果。連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。

Control Out of Range - Stop（質控超出範圍一停止）

一個或多個質控品檢體產生超出範圍的測試結果。連續出現此情況的次數已符合爲停止消息指定的標準。出現停止消息時，自動進樣器停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。

Could Not Attempt Location of a Workorder, Exception Occurred（發生異常，無法找到工作指令）

由於發生軟體錯誤，找不到檢體工作指令。

糾正措施

已對所影響的檢體應用默認選擇。如果需要，重新測試檢體。

Cycle Aborted for Unknown Reason - Reset Requried（周期由於未知原因終止一需要重置）

分析儀已觸發周期終止條件，但計算機不識別給出的原因。

糾正措施

1. 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。
2. 約 1 分鐘後，如果狀態欄不顯示 Ready to Run（做好運行準備）且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。
 a. 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADV - A）**。
 b. 在分析儀觸控板上選擇 **Off（關）**。
 c. 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。
 d. 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。

D

Data Manager Critical Error（數據管理器嚴重錯誤）

一個內部軟體通信錯誤已觸發高級別數據管理器錯誤。

糾正措施

1. 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。
2. 選擇 CTRL+ALT+DELETE，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Defined More Than Once In File（在文件中定義多次）

注意：此消息可能以關鍵字或測試代碼開頭。

可能原因	糾正措施
1 在 Report.par、Prevalid.par、Print.par 或 QCreport.par 文件的標題中多次設置了同一關鍵字。在結果塊中，不能在星號(*)之後插入空行或演示行。	使用 Format（格式）窗口更正文件布局。
2 在*.par 文件中使用了兩次同一測試代碼。	在 Tools Modify（修改工具）中，從*.par 文件中刪除重覆的測試代碼。

DEFOAMER Reagent Empty – Stop（DEFOAMER 試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

DEFOAMER Reagent Expired（DEFOAMER 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 DEFOAMER 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

DEFOAMER Reagent Low – Alarm（DEFOAMER 試劑過少－警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

E

Error Opening Port（打開端口時出錯）

系統準備（初始化）過程中可能發生該錯誤。

糾正措施

在 Log On/Off（登錄／註銷）窗口中選擇 Shut Down ADVIA（關閉 ADVIA）。選擇 CTRL+ALT+DELETE，然後重新登錄到系統以便重新啓動軟體。如果再次發生該錯誤，檢查發生問題的通信端口（COM1 或 MCA Serial Board）。

EZ KLEEN Reagent Empty – Stop（EZ KLEEN 試劑空一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

EZ KLEEN Reagent Expired（EZ KLEEN 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 EZ KLEEN 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

EZ KLEEN Reagent Low – Alarm（EZKLEEN 試劑過少一警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

F

File Does Not Exist（文件不存在）

已在 Routine Parameters（常規參數）窗口中選擇了列印輸出患者或質控品結果。但尚未定義 Report.par、Prevalid.par、Print.par 或 QCreport.par 文件之一。

糾正措施

在 Other Utilities（其他工具）窗口中恢復目錄。

File Not Found :（未找到文件：）C:\Wst\Oen.cnf

默認的工作指令屏幕配置文件缺失。

糾正措施

根據需要，繼續在 Order Entry（工作指令）中創建工作指令。要恢復 Oen.cnf 文件，選擇 Other Utilities（其他工具）並恢復目錄。

File Not In Modifiable File List - Updating（文件未包含在可修改文件列表中一正在更新）

在 Format（格式）窗口中創建文件時會顯示該消息。然後，會將該文件存儲到數據庫中。

糾正措施

無需採取措施。

G

GETEQUAL

該質控品未在 Control Dictionary（質控目錄）中定義。

糾正措施

在 Control Dictionary（質控目錄）中定義該質控品。

GlobalLock 或 GlobalUnlock

檢體記錄已滿，所以無法存儲所選處理。

糾正措施

減少所選處理的數量或者取消選擇，然後在 Order Entry（工作指令）窗口中創建一個新工作指令。

H

HGB Colorimeter Error - Reset Requried（HGB 比色計錯誤—需要重置）

與 HGB 比色計關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件故障	a **Utilities**（工具）、**Exerciser**（執行）、**Indicators**（指示燈）、**Analyzer Reset**（分析儀重置）來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA**（**關閉 ADVIA**）。 ii 在分析儀觸控板上選擇 **Off**（**關**）。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On**（**開**），重新啓動分析儀。
2 電源、保險絲、電纜、HGB 接口節點電路板或 Can 通信擾頻器電路板存在故障。	致電 Siemens Service 以獲得幫助。

HGB Concentration Variance – Alarm（HGB 濃度方差一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

HGB Concentration Variance – Stop（HGB 濃度方差一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

HGB Irregular Flow Rate – Alarm（HGB 流速異常一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

HGB Irregular Flow Rate – Stop（HGB 流速異常一警示）

連續出現此情況的次數已符合爲停止消息指定的標準。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

HGB Power Low – Alarm（HGB 電量過低一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

HGB Power Low – Stop（HGB 電量過低一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

HGB Reagent Empty – Stop（HGB 試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Star/Stop（開始／停止）以繼續運行。

HGB Reagent Expired（HGB 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 HGB 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

HGB Reagent Low – Alarm（HGB 試劑過少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

Hyperchromia - Alarm（高血紅素濃度—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Hyperchromia - Stop（高血紅素濃度一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Hypochromia - Alarm（著色過淺一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Hypochromia - Stop（著色過淺一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

I

Image Affected to Wrong Group（圖像影響到錯誤組）

Customer Parameters（客戶參數）中的兩個設置相互衝突。

Customer Parameters（客戶參數）§ 21 中的參數 ASSOCIATE CBC/DIFF IMAGE WITH A TEST GROUP 和 ASSOCIATE RETIC IMAGE WITH A TEST GROUP 只能設置爲與測試組相關聯的值。測試組在 Customer Parameters（客戶參數）§17 中定義。

糾正措施

1. 在 Tools Modify（修改工具）模式下打開 **Customer Parameters（客戶參數）**。
2. 在 Customer Parameters（客戶參數）§17 中定義測試組。
3. 在§21 中設置與所定義測試組對應的值。

或

1. 在 Tools Modify（修改工具）模式下打開 **Customer Parameters（客戶參數）**。
2. 在§21 中將值設置爲 **= 0**。

Immature Granulocytes - Alarm（未成熟粒細胞－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Immature Granulocytes - Stop（未成熟粒細胞—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Indicator and Switch Error - Reset Requried（指示燈和開關錯誤—需要重置）

與前面板上的開關／指示燈關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件故障	**a** 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 **b** 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 **i** 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 **ii** 在分析儀觸控板上選擇 **Off（關）**。 **iii** 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 **iv** 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 連接到開關／指示燈的電纜已卷曲。	在分析儀觸控板上選擇 **Off（關）**以檢查電纜是否卷曲。必要時鬆升卷曲的電纜，然後在分析儀觸控板上選擇 **On（開）**以重新啓動分析儀。
3 電源、保險絲、開關／指示燈電路板、電纜、並行節點電路板、Can 通信擾頻器電路板或開關／指示燈面板存在故障。	致電 Siemens Service 以獲得幫助。

Initialization Failed - During Communication from Analyzer（初始化失敗－在與分析儀通信的過程中）

軟體通信錯誤。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1. 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。
2. 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Initialization Failed - During Configuration Download（初始化失敗－在配置下載的過程中）

軟體通信錯誤。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1. 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。
2. 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Initialization Failed – During Download of Cycle Definition（初始化失敗－在下載周期定義的過程中）

軟體通信錯誤。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1. 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。
2. 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Initialization Failed - During Image Download（初始化失敗－在圖像下載過程中）

軟體通信錯誤。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。

2 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Initialization Failed - During OMF File Download（初始化失敗一在下載 OMF 文件的過程中）

軟體通信錯誤。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。

2 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Initialization Failed - Waiting for Waste and Rinse Clear（初始化失敗一等待廢液和沖洗液清除）

在進行系統準備的過程中，鞘液／沖洗液爲空或廢液容器已滿。

可能原因	糾正措施
1 在進行系統準備的過程中，鞘液／沖洗液爲空。	更換 SHEATH/RINSE 試劑。系統準備過程會自動繼續進行。
2 在進行系統準備的過程中廢液容器已滿。	清空廢液容器並進行更換。系統準備過程會自動繼矮進行。

Initialization Failed - Writing Image Download（初始化失敗一寫入圖像下載）

軟體通信錯誤，也有可能是乙太網電纜存在故障（從分析儀一 J2 工作站連接到計算機）。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1 在 Log On/Off（登錄／註銷）窗口中選擇 Shut Down ADVIA（關閉 ADVIA）。

2 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，確認乙太網電纜已牢固連接，必要時進行更換。如果問題再次出現，請致電 Siemens Service 以獲得幫助。

Invalid/Unknown TDC Error（無效／未知 TDC 錯誤）

發生無法識別的 Data Manager（數據管理器）錯誤。

糾正措施

按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動：

1 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。

2 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。

Invalid Configuration, Mandatory Field Missing（無效配置，缺少必填字段）

配置文件不正確。缺少一個必填字段。

糾正措施

在 Screen Configuration（屏幕配置）窗口中，更正配置文件。選擇 Customize（自定義）菜單，System Setup（系統設置）、Tools Modify（修改工具）和 Screen Configuration（屏幕配置）。

主機測試號無效(= 0)

在 Test Dictionary（測試目錄）中爲測試定義的主機號不正確。

更正操作

在 Test Dictionary（項目目錄）的 Characteristics（字符）中驗證主機號。

Invalid Morphology Flags Host Number:（無效形態學警示主機號：）xxx

Data Manager（數據管理器）無法管理來自分析儀的形態學警示，也無法將其傳輸到主機。

糾正措施

致電 Siemens Service 以獲得幫助。

數值結果格式無效

在 Review and Edit（檢查並編輯）窗口中編輯的結果的格式與通信協議不兼容。

糾正措施

確認該格式會顯示四個結果，每個結果一個字符。

Invalid RBC or WBC Flag（無效 RBC 或 WBC 警示）

分析儀中的 RBC 或 WBC 值不正確或未定義。檢體不會傳輸到主機。

糾正措施

確認結果中包含四個結果，每個結果一個字符。

Invalid System Number（無效系統編號）

參數文件中定義的計算機系統編號（應用於主機）不正確或並未定義。

糾正措施

致電 Siemens Service 以獲得幫助。

Invalid Test Code in Report.par File（Report.par 文件中的無效測試代碼）

在 Report.par 文件中輸入的測試代碼無效。

糾正措施

使用 Format（格式）窗口中的 Key（關鍵字）列表更正問題。

J

K

L

Large Platelets - Alarm（大血小板一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Large Platelets - Stop（大血小板一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

Laser Power Low - Alarm（激光能量低一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Laser Power Low - Stop（激光能量低一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Left Shift - Alarm（核左移一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Left Shift - Stop（核左移一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Length of Range Field Too Long in REPORT.PAR File（REPORT.PAR 文件中的範圍字段任度過長）

在 Report.par 文件中定義的範圍不正確。

糾正措施

使用 Format（格式）窗口更正該問題。

M

Macrocytosis - Alarm（大紅血球一警示）

連續出現此情況的次數已達到爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Macrocytosis - Stop（大紅血球一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Manual Sample ID - Auto Increment Off（手動檢體 ID－自動遂增關閉）

自動遞增功能已被關閉。(使用 Operations（操作）、Manual Sample ID（手動檢體 ID）。將不會爲手動吸取檢體的檢體 ID 自動增加一。
必須使用鍵盤、條碼閱讀器或工作指令檢體 ID。

Manual Sample ID - Auto Increment On（手動檢體 ID－自動遞增打開）

已選擇自動遞增功能。(使用 Operations（操作）、Manual Sample ID（手動檢體 ID）。對於後續的每次吸取，將不會爲手動吸取檢體的檢體 ID 自動增加一。

Matching Not Possible - Mismatch of Sample Types（無法匹配—檢體類型不匹配）

主機發送的測試請求與不匹配檢體不是同一類型。測試請求被拒絕，且檢體仍然不匹配。

糾正措施

驗證主機測試表的準確性。驗證 Test Dictionary（項目目錄）中的類型。選擇 Customize（自定義）菜單、System Setup（系統設置）、Tools Modify（修改工具）、Test Dictionary（項目目錄）。

Microcytosis - Alarm（小紅血球—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Microcytosis - Stop（小紅血球—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）重置的計數器。

MPO Deficiency - Alarm（髓過氧物酶缺陷症－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

MPO Deficiency - Stop（髓過氧物酶缺陷症一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

N

NACK Received（收到 NACK）

在主機通信中發生衝突。

糾正措施

致電 Siemens Service 以獲得幫助。

No BASO MN/PMN Valley - Alarm（無 BASO MN/PMN 谷－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

No BASO MN/PMN Valley - Stop（無 BASO MN/PMN 谷一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

No Cell Cluster Fit On PEROX – Alarm（PEROX 上無細胞簇一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

No Cell Cluster Fit On PEROX – Stop（PEROX 上無細胞簇一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

No Data Available in Result Message（結果消息中無可用數據）

Data Manager（數據管理器）無法識別從分析儀收到的結果類型。

糾正措施

致電 Siemens Service 以獲得幫助。

No Graphic Result Data in Result Message（結果消息中無圖形結果數據）

Data Manager（數據管理器）無法在將圖形結果存儲到數據庫之前討其進行壓縮。

糾正措施

致電 Siemens Service 以獲得幫助。

No Help Available for this Message（沒有可用於此消息的幫助）

目前還不提供有關此消息的 Help（幫助）。如果在《操作者指南》中沒有找到足夠的訊息，請與 Siemens 公司的代表聯繫以獲得幫助。

No Numerical Result in Result Message（結果消息中無數值結果）

Data Manager（數據管理器）無法將 CBC/DIFF 或 Retics 結果轉換爲數值或注釋結果。

糾正措施

致電 Siemens Service 以獲得幫助。

No PEROX Noise/Lymph Valley - Alarm（無 PEROX Noise/Lymph 谷－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

No PEROX Noise/Lymph Valley - Stop（無 PEROX 噪音／Lymph 谷－停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

No Test（無測試）

從主機發送的測試請求存在消息問題。

糾正措施

驗證主機正在發送測試請求。如果問題再次出現，請致電 Siemens Service 以獲得幫助。

No Type（無類型）

主機發送的測試請求類型在 Test Dictionary（項目目錄）中未定義。

糾正措施

驗證主機測試表的準確性。在 Test Dictionary（項目目錄）中定義該測試。選擇 Customize（自定義）菜單、System Setup（系統設置）、Tools Modify（修改工具）、Test Dictionary（項目目錄）。

No Workorder - Alarm（無工作指令－警示）

沒有收到當前患者檢體的工作指令。連續出現此情況的次數已符合爲警示消息指定的標準。

可能原因	糾正措施
1 還沒有爲當前患者檢體創建工作指令。	驗證是否已在計算機主機或 Data Manager（數據管理器）中創建了工作指令。
2 還沒有爲當前患者檢體傳輸工作指令。	在計算機主機上檢查是否存在問題。如果問題不是出在主機中，請致電 Siemens Service 以獲得幫助。

No Workorder - Stop（無工作指令一停止）

沒有收到當前患者檢體的工作指令。連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器已停止。

可能原因	糾正措施
1 還沒有爲當前患者檢體創建工作指令。	驗證是否已在計算機主機或 Data Manager（數據管理器）中創建了工作指令。
2 還沒有爲當前患者檢體傳輸工作指令。	在計算機主機上檢查是否存在問題。如果問題不是出在主機中，請致電 Siemens Service 以獲得幫助。

No Working Buffer Initialized（未初始化工作緩衝區）

系統準備（初始化）過程中可能發生該錯誤。

糾正措施

重新啓動 ADVIA 2120/2120i 軟體。如果再次發生該錯誤，請致電 Siemens Service 以獲得幫助。

Noise BASO – Alarm（BASO 噪音－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Noise BASO – Stop（BASO 噪音一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Noise PEROX – Alarm（PEROX 噪音一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Noise PEROX – Stop（PEROX 噪音一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Non WBC Interference - Alarm（非 WBC 干擾一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Non WBC Interference - Stop（非 WBC 干擾一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Nucleated Red Blood Cells - Alarm（有核紅血球一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Nucleated Red Blood Cells - Stop（有核紅血球一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

$ > NULL - Delta Check Alarm Not Defined（# $ > NULL－增量檢查警示未定義）

增量檢查功能已在參數文件中定義，但未在 Alarm Dictionary（警示目錄）中定義。

糾正措施

在 Alarm Dictionary（警示目錄）中定義增量檢查警示。

NULL - Delta Check Alarm Not Selected（空一未選擇增量檢查警示）

在參數文件中未定義增量檢查功能。

糾正措施

致電 Siemens Service 以獲得有關修改參數文件的幫助。

NULL - Number Max of Rerun Not Defined（空一未定義最大重新測試次數）

在參數文件中未定義授權重新測試的次數。

糾正措施

使用 Customer Parameters（客戶參數）窗口定義 Max Number of Automatically Proposed Reruns 參數，指定 Data Manager（數據管理器）提出的最大重新測試次數。

NULL - Status Modified（空一狀態已修改）

指定檢體的狀態已修改。

糾正措施

不需要操作者採取措施。

O

Open Port Error（打開端口錯誤）

發生軟體準備（初始化）錯誤。

糾正措施

1. 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。
2. 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。
3. 如果再次發生錯誤，請選擇 **Cusiomize（自定義）**菜單、**System Setup（系統設置）**、**Tools Modify（修改工具）**、**Port Configuration（端口配置）**。
4. 驗證 Inst1 設備是否作爲 ADVIA 2120/2120i 列出，必要時進行更正。
5. 檢查發生問題的通信端口（COM1 或 MCA Serial board）。

如果系統正在使用 Host Spec 79 Network 連接，Siemens Field Service 的員工應確保指定的主機名和 IP 地址均正確無誤：

1. 使用 Windows 資源管理器打開目錄 **C:\WINNT\system32\drivers\etc**。
2. 雙擊以選擇 **Hosts（主機）**。
3. 在 Open with（打開方式）框中，選擇 **Notepad（記事簿）**，然後選擇 **OK（確定）**。
4. 在文檔底部，驗證主機的 IP 地址和計算機主機名稱與計算機主機管理員提供的對應訊息相符。確保使用至少一個空格分隔地址和名稱。
5. 如果主機名稱或 IP 地址出錯，請相底地更正。然後在 File（文件）菜單上選擇 **Save（保存）**。
6. 關閉記事簿。

OPEN – Sid# Already Exists（打開－Sid#已存在）

主機向 Data Manager（數據管理器）發送的工作指令在數據庫中已存在。Data Manager（數據管理器）無法使用新工作指令更新當前工作指令，因爲檢體狀態爲 Incomplete（不完整）、Current Complete（當前完整）、Complete（完整）或 All Complete（全部完整）。

P

Parallel Node Error - Reset Requried（並行節點錯誤—需要重置）

與並行節點電路板關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件通信錯誤或硬件故障	**a** 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 **b** 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 **i** 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 **ii** 在分析儀觸控板上選擇 **Off（關）**。 **iii** 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 **iv** 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 電源、保險絲、電纜、並行節點電路板或 Can 通信擾頻器電路板板存在故障。	致電 Siemens Service 以獲得幫助。

Patient QC Formula Not Defined（未定義患者 QC 公式）

在沒有爲 FSE 參數 Calculs_PatientQC_Formula 定義值時會發生該錯誤。該參數確定用於計算移動均值的公式。要定義該參數，請與您當地的 Siemens 技術支持提供商聯繫。

該參數的可能設置包括：

0 ＝ 參數未啓用

1 ＝ Bull's 算法

2 ＝ 算術平均值

Patient QC Formula Not Defined - Parameterization - Calcul（患者 QC 公式未定義—參數化—計算）

在沒有爲 FSE 參數 Calculs_PatientQC_Formula 定義值時會發生該錯誤。該參數確定用於計算移動均值的公式。要定義該參數，請與您的 Siemens Field Service 代表聯繫。

該參數的可能設置包括：

0 ＝ 參數未啓用

1 ＝ Bull's 算法

2 ＝ 算術平均值

Patient Result Database Is Full（患者結果數據庫已滿）

患者結果數據庫已達到最大容量，導致自動進樣器停止並將系統狀態轉換爲 Aspiration Paused（吸取已暫停）。

糾正措施

從檢體結果文件中刪除數據，增加可用的患者結果數據庫空間。使用 Customize（自定義）、System Setup（系統設置）、Tools Modify（修改工具）、End of Day（工作結束）。

重要訊息

刪除文件會永久性地擦除數據。如果需要數據的電子副本，請在刪除前備份文件。

Patient Result Database Is Nearly Full（患者結果數據庫將滿）

患者結果數據庫已達到警告水平指定的水平，導致自動進樣器停止並將系統狀態轉換爲 Ready to Run（準備運行）。

糾正措施

從檢體結果文件中刪除數據，增加可用的患者結果數據庫空間。使用 Customize（自定義）、System Setup（系統設置）、Tools Modify（修改工具）、End of Day（工作結束）。

重要訊息

刪除文件會永久性地擦除數據。如果需要數據的電子副本，請在刪除前備份文件。

Pattern File (Win.cus) Does Not Exist（模式文件(Win.cus)不存在）

包含客戶參數的文件不存在。已創建使用默認值的替換文件。

糾正措施

致電 Siemens Service 以獲得幫助。

PEROX 1 Reagent Empty – Stop（PEROX 1 試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

PEROX 1 Reagent Expired（PEROX 1 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 PEROX 1 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX 1 Reagent Low – Alarm（PEROX 1 試劑過少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX 2 Reagent Empty – Stop（PEROX 2 試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

PEROX 2 Reagent Expired（PEROX 2 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 PEROX 2 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX 2 Reagent Low – Alarm（PEROX 2 試劑過少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX 3 Reagent Empty – Stop（PEROX 3 試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

PEROX 3 Reagent Expired（PEROX 3 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 PEROX 3 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX 3 Reagent Low – Alarm（PEROX 3 試劑進少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX Irregular Flow Rate – Alarm（PEROX 流速異常—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

PEROX Irregular Flow Rate – Stop（PEROX 流速異常—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

PEROX Power Low – Alarm（PEROX 電量過低—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

PEROX Power Low – Stop（PEROX 電量過低—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

PEROX Sample Pump Error - Reset Requried（PEROX 檢體泵錯誤－需要重置）

PEROX 檢體注射泵未處於初始位置、無法響應或發生傳輸錯誤。

可能原因	糾正措施
1 PEROX 檢體注射泵未移動或未處於初始位置。	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。

		ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2	PEROX 檢體注射器的組裝不正確。	按照”更換注射器推筒”中的步驟進行操作。
3	電源、保險絲、電纜、泵裝置、Can Bus 通信擾頻器電路板或雙伺服泵控制電路板存在故障。	致電 Siemens Service 以獲得幫助。

PEROX Saturation – Alarm（PEROX 飽和－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

PEROX Saturation – Stop（PEROX 飽和—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

PEROX SHEATH Pump Error - Reset Required（PEROX 鞘液泵錯誤－需要重置）

PEROX 鞘液注射泵未處於初始位置、無法響應或發生傳輸錯誤。

可能原因	糾正措施
1 PEROX 鞘液注射泵未移動或未處於始位置。	a 選擇 **Utilities**（工具）、**Exerciser**（執行）、**Indicators**（指示燈）、**Analyzer Reset**（分析儀重置）來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA**（**關閉 ADVIA**）。 ii 在分析儀觸控板上選擇 **Off**（**關**）。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On**（**開**），重新啓動分析儀。
2 PEROX 鞘液注射器的組裝不正確。	按照”更換注射器推筒”中的步驟進行操作。
3 電源、保險絲、電纜、泵裝置、Can Bus 通信擾頻器電路板或雙伺服泵控制電路板存在故障。	致電 Siemens Service 以獲得幫助。

PEROX SHEATH Reagent Empty – Stop（PEROX 鞘液試劑空—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Start/Stop（開始／停止）以繼續運行。

PEROX SHEATH Reagent Expired（PEROX 鞘液試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 PEROX 3 鞘液試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX SHEATH Reagent Low – Alarm（PEROX 鞘液試劑過少—警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

PEROX Temperature Out – Alarm（PEROX 溫度超出範圍－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

PEROX Temperature Out – Stop（PEROX 溫度超出範圍—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Platelet Clumps - Alarm（血小板凝集－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Platelet Clumps - Stop（血小板凝集一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Platelet Noise - Alarm（血小板噪音一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Platelet Noise - Stop（血小板噪音一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Possible Blasts or Abnormal Cells - Alarm（可能爲原始細胞或異常細胞一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

Possible Blasts or Abnormal Cells - Stop（可能爲原始細胞或異常細胞一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Power Pack Temperature High（電源溫度過高）

電源的內部溫度已超過最高限值。

可能原因	糾正措施
1 風扇過濾器較髒	關閉系統，按照《操作者指南》中的說明，取下並清潔空氣循環過濾器。
2 系統內部溫度超過最高限值	a 關閉系統。 b 讓系統冷卻 15 分鐘。 c 重新啓動系統。 d 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
3 風扇不能正常運轉。	檢查風扇的運行。如果您懷疑某個風扇沒有正常工作，請致電 Siemens Service 以獲得幫助。
4 電源溫度傳感器存在故障	致電 Siemens Service 以獲得幫助。

Pressure Node Error - Reset Requried（壓力節點錯誤—需要重置）

與壓力節點電路板關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件故障	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 壓力超出範圍。	驗證壓力讀數，必要時進行調節。

3	電源、保險絲、電纜、壓力／開關節點電路板或 Can Bus 通信擾頻器電路板存在故障。	致電 Siemens Service 以獲得幫助。

Printer Busy - Printing Aborted（印表機忙—列印已中止）

請求列印輸出時，印表機處於忙狀態。

糾正措施

當印表機空閒時重新開始列印輸出。

Printer Not Defined（印表機未定義）

在 Port Configuration（端口配置）窗口中未定義印表機。

糾正措施

在 Port Configuration（端口配置）窗口中更正或輸入印表機定義。選擇 Customize（自定義）菜單、System Setup（系統設置）、Tools Modify（修改工具）、Port Configuration（端口配置）。

Printer Not Ready - Impression Aborted（印表機未就緒—列印已中止）

在後台列印結果報告時發生印表機問題。不顯示消息框。只要印表機可用，列印輸出就會恢復。

糾正措施

檢查印表機連接和操作。

Printer Problem - Alarm（印表機問題—警示）

發生印表機問題。連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

糾正措施

檢查印表機連接和操作。典型印表機問題包括：

- 卡紙

- 缺紙
- 印表機脫機
- 印表機斷開

Printer Problem - Stop（印表機問題—停止）

發生印表機問題。連續出現此情況的次數已符合爲停止消息指定的標準。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

糾正措施

檢查印表機連接和操作。典型印表機問題包括：

- 卡紙
- 缺紙
- 印表機脫機
- 印表機斷開

Probe Clog（探針堵塞）

導電檢測器在 20 秒吸取時間內未檢測到檢體。

可能原因	糾正措施
1 檢體凝結	檢查檢體是否凝結。
2 檢體容量不足	可能在吸取完成之前已取下檢體試管。重新吸取檢體。如果錯誤反複出現，請清潔檢體分血閥。
3 真空度不足	檢查真空計，必要時進行調節。
4 凝塊過濾器堵塞	取下凝塊過濾器，將其作爲存在生物危害的物品廢棄。更換凝塊過濾器。
5 檢體管連接鬆動	檢查連接，必要時擰緊連接。
6 針堵塞	沖洗針。選擇 **Utilities（工具）**菜單、**Hydraulic Functions（液路功能）**選項、**Needle Rinse（針沖洗）**。
7 針彎曲或已損壞	更換針。按照”更換進樣器針”中的步驟操作

8	導電檢測器存在故障	請與您當地的 Siemens 技術支持提供商聯繫以獲得幫助。

Q

Qc Sample Deleted Before Validation（QC 檢體在驗證前已刪除）

尚未驗證的一個質控品檢體已被刪除。

每日 QC 可能不一致。

R

Rack or Position Barcode Not Read - Alarm（未讀取樣品架或位置條碼一警示）

條碼閱讀器無法爲當前試管位置確定有效的樣品架 ID 或位置編號。連續出現此情況的次數已符合在 Alarm/Stop Criteria（警示／停止標準）窗口中爲警示消息指定的標準。

可能原因		糾正措施
1	條碼標籤的位置不正確、模糊或不存在。	檢查是否已正確黏貼條碼標籤且符合規範。必要時重新連接電纜。
2	條碼閱讀器存在故障。	致電 Siemens Service 以獲得幫助。

Rack or Position Barcode Not Read - Stop（未讀取樣品架或位置條碼一停止）

條碼閱讀器無法爲當前試管位置確定有效的樣品架 ID 或位置編號。連續出現此情況的次數已符合在 Alarm/Stop Criteria（警示／停止標準）窗口中爲停止消息指定的標準，自動進樣器已停止。

可能原因		糾正措施
1	條碼標籤的位置不正確、模糊或不存在。	檢查是否已正確黏貼條碼標籤且符合規範。必要時重新連接電纜。
2	條碼閱讀器存在故障。	致電 Siemens Service 以獲得幫助。

RBC Fragments – Alarm（RBC 試劑一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RBc Fragments – Stop（RBC 試劑－停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RBC Ghosts – Alarm（RBC 影紅血球一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RBC Ghosts – Stop（RBC 影紅血球一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RBC Irregular Flow Rate – Alarm（RBC 流速異常－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RBC Irregular Flow Rate – Stop（RBC 流速異常一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RBC Reagent Empty – Stop（RBC 試劑空一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。試劑爲空，且自動進樣器已停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置停止計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。選擇 Star/Stop（開始／停止）以繼續運行。

RBC Reagent Expired（RBC 試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出 RBC 試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

RBC Reagent Low – Alarm（RBC 試劑過少－警示）

連續出現此情況的次數已符合爲警示消息指定的標準，指示試劑液面過低。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）、Reagent Conditions（試劑條件）中定義。

糾正措施

補充試劑並更新 Reagent Installation（試劑安裝）窗口後，會自動重置警示計數器。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

RBC Sample Pump Error - Reset Requried（RBC 檢體泵錯誤—需要重置）

RBC 檢體注射泵未處於初始位置、無法響應或發生傳輸錯誤。

可能原因	糾正措施
1 RBC 檢體注射泵未移動或未處於始位置。	**a** 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 **b** 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 **i** 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 **ii** 在分析儀觸控板上選擇 **Off（關）**。 **iii** 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 **iv** 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 RBC 檢體注射器的組裝不正確。	按照”更換注射器推筒”中的步驟進行操作。
3 電源、保險絲、電纜、泵裝置、Can Bus 通信擾頻器電路板或雙伺服泵控制電路板存在故障。	致電 Siemens Service 以獲得幫助。

RBC Sheath Pump Error - Reset Requried（RBC 鞘液泵錯誤—需要重置）

RBC 鞘液注射泵未處於初始位置、無法響應或發生傳輸錯誤

可能原因	糾正措施
1 RBC 鞘液注射泵未移動或未處於初始位置。	**a** 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 **b** 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 **i** 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 **ii** 在分析儀觸控板上選擇 **Off（關）**。 **iii** 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 **iv** 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 RBC 鞘液注射器的組裝不正確。	按照”更換注射器推筒”中的步驟進行操作。
3 電源、保險絲、電纜、泵裝置、Can Bus 通信擾頻器電路板或雙伺服泵控制電路板存在故障。	致電 Siemens Service 以獲得幫助。

Ready to Run（做好運行準備）

系統已準備好接受吸取的檢體或開始液路循環。指示可開始吸取的綠色燈亮起。

Results Received for Tube Not in（收到的試管結果未包含在掛起文件中）

掛起文件 Sid #: xxx Seq #：收到的一組檢體結果未包含在掛起文件中。該組結果已被拒絕並刪除。

糾正措施

在運行前檢查掛起列表。

RETIC Absorption Distribution Abnormal - Alarm（網狀紅血球吸收分布異常—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC Absorption Distribution Abnormal - Stop（網狀紅血球吸收分布異常—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC Fit Suspect - Alarm（疑似網狀紅血球擬合—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC Fit Suspect - Stop（疑似網狀紅血球擬合—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC Irregular Flow Rate - Alarm（網狀紅血球流速異常一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC Irregular Flow Rate - Stop（網狀紅血球流速異常一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC Noise Origin - Alarm（網狀紅血球噪音源一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC Noise Origin - Stop（網狀紅血球噪音源一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC - PLT Interference/Error - Alarm（網狀紅血球一 PLT 干擾／錯誤－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC - PLT Interforencel Error - Stop（網狀紅血球一 PLT 干擾／錯誤－停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC RBC Count Low - Alarm（網狀紅血球計數低一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC RBC Count Low - Stop（網狀紅血球計數低一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC Saturation Cells - Alarm（網狀紅血球飽和－警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC Saturation Cells - Stop（網狀紅血球飽和一停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

RETIC Slope Error - Alarm（網狀紅血球斜率錯誤—警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

RETIC Slope Error - Stop（網狀紅血球斜率錯誤—停止）

連續出現此情況的次數已符合爲停止消息指定的標準。自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Review Mode Change to Review NOne（檢查模式更改爲非檢查模式）

已通過 Review and Edit（檢查並編輯）窗口中的 Parameters（參數）菜單修改了驗證模式。

Running（正在運行）

在按下自動進樣器的 Start/Stop（開始／停止）按鈕或在檢體處理過程中顯示。

可能原因	糾正措施
如果系統在處於 **Running（正在運行）**狀態時中止，可能存在硬件或軟體故障。	**a** 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 **b** 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 **i** 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 **ii** 在分析儀觸控板上選擇 **Off（關）**。 **iii** 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 **iv** 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。

S

$ > Sample ID Not Read – Alarm（# $ > 檢體 ID 未埃取一警示）

檢體試管條碼標籤不可讀或缺失。連續出現此情況的次數已符合爲警示消息指定的標準。

可能原因	糾正措施
1 條碼標籤的位置不正確、模糊或不存在。	確認條碼存在並已正確爲檢體試管使用（標籤接觸塞子的邊緣）確認條碼清晰且符合規定的質量要求。
2 條碼閱讀器存在故障。	致電 Siemens Service 以獲得幫助。

Sample ID Not Read - Stop（檢體 ID 未讀取一停止）

檢體試管條碼標籤不可讀或缺失。連續出現此情況的次數已符合爲停止消息指定的標準，自動進樣器已經停止。

可能原因	糾正措施
1 條碼標籤的位置不正確、模糊或不存在。	確認條碼存在並已正確爲檢體試管使用（標籤接觸塞子的邊緣）確認條碼清晰且符合規定的質量要求。
2 條碼閱讀器存在故障。	致電 Siemens Service 以獲得幫助。

Sample Rejected: SID #（檢體已被拒絕：SID #）

最後吸取的該檢體的結果已被拒絕。該檢體記錄已滿。檢體記錄只能保存 110 個結果，其中包括 C.Res、Prev.Run 和 Prev.Res。

糾正措施

使用相同的患者基本訊息創建一個新工作指令，然後指定一個新的 SID #。使用新 SID # 爲檢體試管重新添加標籤，然後開始運行。

Sample Result Data Communication Failure（檢體結果數據通信失敗）

在結果處理完成之前，會退出 Align Optics（校正光學器件）或 Direct Optics（直接校正光學器件）周期。

糾正措施

觸發該錯誤時生成的結果無效。重新吸取受影響的檢體。

Sample SID Not Found - Printing Aborted（未找到檢體 SID－列印已中止）

Review and Edit（檢查並編輯）窗口中顯示的檢體在數據庫中不存在。系統無法提供請求的列印輸出。

糾正措施

使用 Format（格式）窗口中的 Key（關鍵字）列表更正問題。

Sample Status: - THE STATUS - Sid #: x R&P #: y（檢體狀態：— THE STATUS – Sid#: x R&P#: y）

處於該狀態的檢體無法接收結果。爲該檢體接收的結果已被拒絕。

糾正措施

在 Customer Parameters（客戶參數）窗口中，修改指定各個檢體狀態的參數以便允許接收結果。

Sample xxx Is Not Transmitted to the Host（檢體 xxx 未傳輸到主機）

與計算機主機進行傳輸時存在問題。該消息指出未傳輸檢體的 Sid#。隨後將顯示另一消息，說明具體的問題。

Scan Bus Denied - Reset Autosampler（掃描被拒絕—重置自動進樣器）

條碼閱讀器無法掃描。

可能原因	糾正措施
1 條碼閱讀器的電纜存在故障	**a** 在分析儀的觸控板上，選擇 **Off（關）**。 **b** 等待約 1 分鐘，然後選擇 **On（開）**以重新啓動分析儀。 **c** 如果問題仍然出現，請致電 Siemens Service 以獲得幫助。
2 條碼閱讀器存在故障	請參見 **1a、b、c**

SD Not Defined For Test# xx Control# xxyyzzz（沒有爲 Test# xx Control# xxyyzzz 定義 SD）

在 Control Dictionary（質控目錄）中沒有爲該測試和該質控品定義標準差。

糾正措施

在 Control Dictionary（質控目錄）中定義 SD。

Selected Printer Not Available - Result Report for SID#：（所選印表機不可用一 SID#的結果報告：）

印表機不響應列印請求。

糾正措施

檢查印表機是否已打開並且不缺紙。有關詳細訊息，請參考 Message Log（消息日誌）。

Selector Valve Error（分配閥錯誤）

與選擇器閥裝置關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件故障	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 電源、保險絲、電纜、選擇器閥裝置、UFC 擾頻器電路板或 Can Bus 通信擾頻器電路板存在故障	致電 Siemens Service 以獲得幫助。

Selector Valve Timeout（選擇器閥超時）

選擇器閥無法在預期的時間間隔內返回初始位置。

可能原因	糾正措施
1 硬件故障	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 電源、保險絲、電纜、選擇器閥裝置、UFC 擾頻器電路板或 Can Bus 通信擾頻器電路板存在故障。	致電 Siemens Service 以獲得幫助。

SHEATH/RINSE Reagent Container Empty（鞘液／沖洗液試劑容器爲空）

鞘液／沖洗液的液面下降到鞘液／沖洗液中的液面傳感器一下，指示該容器爲空。在顯示該錯誤消息時，吸取盤將不工作，Ready（就緒）燈也不會亮起。

可能原因	糾正措施
1 鞘液／沖洗液爲空。	更換鞘液／沖洗液試劑，然後使用消息圖標刪除該錯誤消息。
2 液面傳感器發生故障。	致電 Siemens Service 以獲得幫助。

SHEATHIRINSE Reagent Expired（鞘液／沖洗液試劑已過期）

根據試劑容器的條碼標籤確定或根據安裝日期和打開容器的穩定性來計算，當前日期已超出鞘液／沖洗液試劑的有效期。

糾正措施

補充過期的試劑，然後更新 Reagent Installation（試劑安裝）窗口。轉到 Logs（日誌）、Reagent Log（試劑日誌）、Reagent Installation（試劑安裝）。

Sid# Already Exists - Result Message Rejected（Sid#已存在—結果消息被拒絕）

您使用具有以下格式的 Sid#創建了一份工作指令：999XXXX．分析儀使用該格式發送錯誤讀取檢體的結果。結果已被拒絕。

糾正措施

使用正確的 Sid#格式創建工作指令。

Standby（待機）

分析儀處於低電量狀態，可在不運行期間減少組件磨損。指示可開始吸取的綠色燈不會亮起。通常，分析儀會自動進入待機狀態。使用觸控板上的 Standby（待機）按鈕，可以手動退出或進入待機狀態。

糾正措施

如果分析儀鎖定在待機狀態，確認壓力和真空度讀數未超出範圍，必要時進行調整。選擇 Standby（待機）可退出。

Status BTRIEVE - Alarm Not Defined（BTRIEVE 狀態—未定義警示）

Data Manager（數據管理器不識別分析儀發送的警示）（在 Alarm Dictionary（警示目錄）中未定義）。

糾正措施

請參見 Alarm Dictionary（警示目錄）。

Status BTRIEVE - Test Not Found（BTRIEVE 狀態—未找到測試）

已在 Test Dictionary（項目目錄）中擦除在 Control Dictionary（質控目錄）中定義的測試。

糾正措施

在 Test Dictionary（項目目錄）中輸入測試訊息。

Syntax Error in AlarmExc.par（AlarmExc.par 中存在語法錯誤）

參數文件 AlarmExc.par 的定義不正確或者文件中存在空行。在計算患者 QC 時不考慮獨有分析警示。

糾正措施

致電 Siemens Service 以獲得幫助。

System Preparation Failed（系統準備失敗）

在初始系統準備階段發生錯誤。

可能原因	糾正措施
1 軟體通信故障	按照下列步驟退出 ADVIA 2120/2120i 軟體，然後重新啓動。 a 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 b 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。
2 硬件錯誤	有關適當的糾正措施，請參考相關的硬件錯誤消息。
3 CPU 電路板發生故障	致電 Siemens Service 以獲得幫助。

System Preparation in Progress（正在進行系統準備）

在第一次啓動 ADVIA 2120/2120i 或重新啓動該軟體時，分析儀和計算機會完成準備過程，其中包括下列活動：

- 軟體初始化
- 內部診斷檢查
- 對試劑管執行吸取操作
- 啓動，包括後台驗證周期

System Preparation Not Complete（系統準備未完成）

糾正措施

a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示好）**、**Analyzer Reset（分析儀重置）**來重置分析儀。

b 約 1 分鐘後，如果狀態欄不顯示 **Ready to Run（做好運行準備）**，且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。

i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。

ii 在分析儀觸控板上選擇 **Off（關）**。

iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。

T

Test Not Buffered – cTestCode（測試未緩衝一 cTestCode）

Test Dictionary（項目目錄）中存在 60 個以上活動測試。無法在內存中存儲更多測試。

糾正措施

在 Test Dictionary（項目目錄）中取消選擇超出該限值的更多活動測試。選擇 Customize（自定義）菜單、System Setup（系統設置）、Tools Modify（修改工具）、Test Dictionary（項目目錄）。

Tube xxx Not Transmitted to the Host（試管 xxx 未傳輸到主機）

未傳輸預期的結果。

糾正措施

在嘗試重新傳輸該檢體之前，檢查檢體狀態以及文件內容。問題可能是主機方面的確認問題。應當由 Siemens Service 的員工檢查通信線路。

Type Not Found（未找到類型）

Data Manager（數據管理器）不識別主機發送的工作指令類型。不存在與測試請求關聯的類型。

糾正措施

在 Type Table Dictionary（圖表類型目錄）中創建該類型。選擇 Customize（自定義），System Setup（系統設置）、Tools Modify（修改工具）、Type Table Dictionary（圖表類型目錄）。

Types Table Test Doesn't Exist（圖表類型測試不存在）

已在 Test Dictionary（項目目錄）中刪除在 Types Table（圖表類型）中定義的一個測試。

糾正措施

在適當時從 Type Table（圖表類型）中刪除該測試，或者在 Test Dictionary（項目目錄）中重新輸入該測試。

U

UFC Vacuum Out of Range（UFC 真空度超出範圍）

UFC 真空度超出範圍壓縮機真空度與 UFC 真空度的差值大於 5”Hg。

可能原因	糾正措施
1 Vacuumsetting（真空度設置）超出範圍	檢查系統的真空計，必要時調整調節器。 設定點：20” Hg ± 1
2 真空泄漏	**a** 檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。 **b** 檢查廢液容器，確保龍頭已關閉且蓋子已蓋好。
3 真空泵過濾器（通氣過濾器）阻塞。	更換真空泵過濾器。
4 廢液管卷曲	檢查廢液容器上的廢液管是否卷曲。必要時拉直或重新連接相應管道。

UFC Vacuum Out of Range – Stop（UFC 真空度超出範圍一停止）

系統真空度超出範圍。由於真空度已達到極限水平，可能會影響採樣結果的可靠性並損壞分析儀，所以分析儀已停止。壓縮機真空度與 UFC 真空度的差值大於 5” Hg。

可能原因	糾正措施
1 Vacuumsetting（真空度設置）超出範圍	檢查系統的真空計，必要時調整調節器。 設定點：20” Hg ± 1
2 真空泄漏	**a** 檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。 **b** 檢查廢液容器，確保龍頭已關閉且蓋子已蓋好。
3 真空泵過濾器（通氣過濾器）阻塞。	更換真空泵過濾器。
4 廢液管卷曲	檢查廢液容器上的廢液管是否卷曲。必要時拉直或重新連接相應管道。

重要訊息

如果問題仍然出現，請致電 Siemens Service 以獲得幫助。只能由 Siemens 公司的維修人員執行進一步的糾正措施。

Unable to Process Results - Check Instrument Parameterization（無法處理結果—檢查儀器的參數化）

影響結果與數值結果不符。

糾正措施

致電 Siemens Service 以獲得幫助。

Unable to Process Results - Communication Line Fault（無法處理結果—通信線路故障）

通信線路的故障造成無法讀取數值結果。

糾正措施

致電 Siemens Service 以獲得幫助。

Unable to Process Results - IDee Too Long（無法處理結果— ID 過長）

從分析儀接收到的 ID 長度超過 14 位。

糾正措施

檢查檢體 ID 的長度。

Unknown Host Test Number xx（主機測試編號 xx 未知）

來自主機的一份工作指令包含未在 Test Dictionary（項目目錄）中定義的測試，或包含不正確的主機編號。

糾正措施

修改 Test Dictionary（項目目錄）或更正主機測試表。當檢體仍然包含在數據庫中時，不要修改 Test Dictionary（項目目錄）。

V

Vacuum Out of Range（真空度超出範圍）

系統真空度超出範圍。

可能原因	糾正措施
1 真空計超出範圍	檢查系統的真空計，必要時調整調節器。 設定點：20” Hg ± 1
2 真空泄漏	**a** 檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。 **b** 檢查廢液容器，確保龍頭已關閉且蓋子已蓋好。

Vacuum Out of Range - Stop（真空度超出範圍一停止）

系統真空度超出範圍。

可能原因	糾正措施
1 真空計超出範圍	檢查系統的真空計，必要時調整調節器。 設定點：20” Hg ± 1
2 真空泄漏	**a** 檢查液體或氣體管道是否卷曲或斷開。必要時拉直或重新連接相應管道。 **b** 檢查廢液容器，確保龍頭已關閉且蓋子已蓋好。

Valve Node 1 Error – Reset Required（閥節點 1 錯誤—需要重置）

與關聯的閥驅動器 1 電路板關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件故障	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。 iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2 電源、保險絲、電纜、閥驅動器 1 電路板或 Can Bus 通信擾頻器電路板存在故障	致電 Siemens Service 以獲得幫助。

Valve Node 2 Error - Reset Requried（閥節聲 2 錯誤—需要重置）

與關聯的閥驅動器 2 電路板關聯的潛在軟體通信錯誤或硬件故障。

可能原因	糾正措施
1 硬件故障	a 選擇 **Utilities（工具）**、**Exerciser（執行）**、**Indicators（指示燈）**、**Analyzer Reset（分析儀重置）**來重置分析儀。 b 在大約 1 分鐘之後，如果狀態欄中沒有顯示 Ready to Run（做好運行準備），且指示可開始吸取的綠色燈仍然沒有亮起，請按照下列步驟退出 ADVIA 2120/2120i 軟體，關閉分析儀後再重新啓動。 i 在 Log On/Off（登錄／註銷）窗口中選擇 **Shut Down ADVIA（關閉 ADVIA）**。 ii 在分析儀觸控板上選擇 **Off（關）**。 iii 選擇 **CTRL+ALT+DELETE**，然後重新登錄到系統以便重新啓動軟體。

		iv 在分析儀觸控板上選擇 **On（開）**，重新啓動分析儀。
2	電源、保險絲、電纜、閥驅動器 2 電路板或 Can Bus 通信擾頻器電路板存在故障	致電 Siemens Service 以獲得幫助。

W

Waste Container - Full（廢液容器一已滿）

容器中的廢液液面已觸發指示該容器已滿的液面傳感器。在顯示該錯誤消息時，吸取盤將不工作，Ready（就緒）燈也不會亮起。

可能原因		糾正措施
1	廢液容器已滿。	按照”清空廢液容器”中的步驟操作。
2	面傳感器電纜已斷開。	液檢查連接是否牢固。
3	故障級別傳感器。	致電 Siemens Service 以獲得幫助。

WBC Substitution – Alarm（WBC 替換一警示）

連續出現此情況的次數已符合爲警示消息指定的標準。該指定的警示標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。會自動重置與 Alarm Criteria（警示標準）關聯的計數器。

WBC Substitution – Stop（WBC 替換一停止）

連續出現此情況的次數使自動進樣器在顯示停止消息的同時停止。該指定的停止標準由用戶在 Customize Menu（自定義菜單）、System Setup（系統設置）、Alarm/Stop Criteria（警示／停止標準）中定義。選擇 Start/Stop（開始／停止）按鈕時，會重置與 Stop Criteria（停止標準）關聯的計數器。

Wrong Sample Type for Test Number xx（測試編號 xx 具有錯誤的檢體類型）

在 Test Dictionary（項目目錄）中爲該測試定義的類型與正在處理的檢體類型不一致。

糾正措施

檢查 Test Dictionary（項目目錄）和掛起檢體的檢體類型是否正確。

Wrong Test Group Defined（定義了錯誤的測試組）

已在多個測試組中定義測試，或已在測試組中定義一個測試但未在 Test Order Table（測試命令表）中定義該測試。Data Manager（數據管理器）無法管理定義的測試組。

糾正措施

使用 Customer Parameters（客戶參數）窗口更正測試組定義。

X

Y

Z

方法

嗜碳性粒細胞／分葉核方法 3

細胞化學反應 3
嗜鹼性粒細胞／分葉核溫度控制 3
ADVIA 2120/2120i BASO 試劑 3
ADVIA 2120/2120i 鞘液／沖洗液 3
測量 4
BASO RATE（BASO 率）直方圖 4
BASO X 直方圖 5
BASO Y 直方圖 5
BASO 細胞直方圖：組群分析 5
BASO 細胞直方圖：直方圖分析 7
異常細胞位置 9
計算參數 11

腦脊液 CSF 方法 15

細胞化學反應 15
測量 16
CSF SCATTER/SCATTER（CSF 散射／散射）細胞直方圖 16
CSF SCATTER/ABSORPT10N（CSF 散射／吸收）細胞直方圖 16
計算參數 17

血紅素方法 20

化學反應 20
測量 21
計算參數 23

過氧化物酶染色方法 24

細胞化學反應 24
ADVIA 2120/2120i PEROX 1 25
ADVIA 2120/2120i PEROX 2 25
ADVIA 2120/2120i PEROX 3 25
ADVIA 2120/2120i PEROX 鞘液 26
測量 26
PEROX RATE（PEROX 率）直方圖 26
PEROX X 直方圖 27
PEROX Y 直方圖 27
NOISE-LYMPH（噪音－淋巴細胞）直方圖 27
PEROX 細胞直方圖 28
異常細胞位置 29
計算參數 31

紅血球／血小板方法 37

細胞化學反應 37
ADVIA 2120/2120i RBC/PLT 37
測量 37
測量：紅血球方法 38
測量：血小板方法 38

參考書目 39
RBC VOLUME（紅血球體積）直方圖 39
RBC HC 直方圖 39
RBC SCATTER（紅血球散射）細胞直方圖 41
RBC VOLUME/HEMOGLOBIN（紅血球體積／血紅素，V/HC）
細胞直方圖 43
紅血球矩陣 44
PLATELET X（血小板 X）直方圖 44
PLATELET Y（血小板 Y）直方圖 45
PLATELET VOL（血小板體積）直方圖 45
PLATELET PC（血小板 PC）直方圖 45
PLT SCATTER（血小板散射）細胞直方圖 46
PLT VOLUME/PC（PLT 體積／PC）細胞直方圖 47
集成分析 47
計算紅血球參數 48
計算血小板參數 52
NRBC 分析 55
網狀紅血球方法 57
細胞化學反應 57
ADVIA 2120/2120i AUTORECTIC 57
測量 57
網狀紅血球方法命名 58
RETIC RATE HISTOGRAM（RETIC 率直方圖） 59
RETIC ABS FLATNESS（網狀紅血球吸收均勻度）直方圖 59
RETIC（網狀紅血球吸收）直方圖 59
RETIC VOLUME（網狀紅血球體積）直方圖 59
RETIC HC 直方圖 61
RETIC CH 直方圖 62
RETIC SCATTER ABS（網狀紅血球散射吸收）細胞直方圖 63
RETIC V/HC 細胞直方圖 64
RETIC SCATTER（網狀紅血球散射）細胞直方圖 64
參考書目 65
計算網狀紅血球參數 65

嗜鹼性粒細胞／分葉核方法

細胞化學反應

嗜鹼性粒細胞／分葉核細胞化學反應包含兩個步驟：

步驟 1　使用 ADVIA 2120/2120i BASO 試劑裂解紅血球和血小板。

步驟 2　利用 ADVIA 2120/2120i BASO 試劑及反應池中增高的溫度，將除嗜鹼性粒細胞外的所有白細胞都從其細胞質剝離。

現在，基於剝離的白細胞細胞核的形狀及複雜程度，可將其歸類爲單核細胞或多形核細胞。可以輕易將完整的嗜鹼性粒細胞與較小的細胞核區分開。

嗜鹼性粒細胞／分葉核溫度控制

溫度控制對細胞剝離進程非常關鍵。嗜鹼性粒細胞反應池的溫度由分析儀自動監控，必須在 32℃至 34℃之間。

要檢查嗜鹼性粒細胞反應池的溫度：

在 Utilities（工具）菜單中，選擇 **Analyzer Status（分析儀狀態）**。

如需調整嗜鹼性粒細胞反應池的溫度：

1. 在 Special Procedures（特定操作步驟）菜單中，選擇 **Adjust Lamp/Temp（調整燈／溫度）**。
2. 選擇 **Baso Temperature（Baso 溫度）**。

ADVIA 2120/2120i BASO 試劑

注意：有關 ADVIA 2120/2120i BASO 試劑內容物的更詳細訊息，請參見第 8 章。

ADVIA 2120/2120i BASO 試劑包含鄰苯二甲醛和表面活性劑，可裂解紅血球、血小板，以及除嗜鹼性粒細胞外所有白細胞的細胞質。

ADVIA 2120/2120i 鞘液／沖洗液

注意：有關 ADVIA 2120/2120i 鞘液／沖洗液內容物的更詳細訊息，請參見第 8 章。

ADVIA 2120/2120i 鞘液／沖洗液具有多種作用：

用於 Baso 方法、紅血球／血小板方法以及網狀紅血球方法的光學鞘液

- 約束檢體流大小，實現每次只有一個細胞通過觀察區
- 阻止檢體流與流通池壁之間的接觸，防止流通池被阻塞或沾污
- 提供透明光介質，可通過其明確聚焦檢體流

用於 Baso 方法、紅血球／血小板方法、過氧化物酵染色方法、網狀紅血球方法以及血紅素方法的沖洗液

- 清潔用於每種方法的液壓通道

用於血紅素方法的基準溶液

- 提供一個基準讀數

測量

來自嗜鹼性粒細胞反應池的定容細胞懸液通過流通池時，會根據以下各項測量每個白細胞的低角度光散射（2˚至 3˚）和高角度光散射（5˚至 15˚）。

信號：

- 細胞或細胞核的大小
- 核配置，是核形狀與細胞密度的組合

當兩種液體流經流通池時，ADVIA 2120/2120i 鞘液／沖洗液會將檢體流包裹起來。

來自流通池的光學信號會由光電二極管轉換成電脈衝。處理後，有以下可用訊息：

BASO Rate（BASO 率）直方圖顯示 baso 通道中的細胞到達率。

BASO X 直方圖顯示 MN（單個核）種群和 PMN（多形核細胞）種群的高角度光散射訊息（核配置）。

BASO Y 直方圖顯示 MN（單個核）種群的低角度光散射訊息（大小）。

BASO 細胞直方圖由成對低角度和高角度光散射數據組成。組群分析識別單個種群。

如果組群分析無法用於特定檢體，則使用直方圖分析識別細胞群。

BASO Rate（BASO 率）直方圖



BASO Rate（BASO 率）直方圖顯示細胞計數率的均勻性。

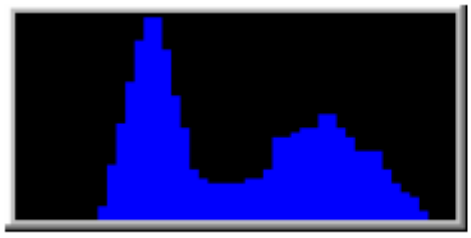
率直方圖數據包含 50 個點，每 200 毫秒獲取一個。每個點代表前 200 秒中計數的有效細胞數。

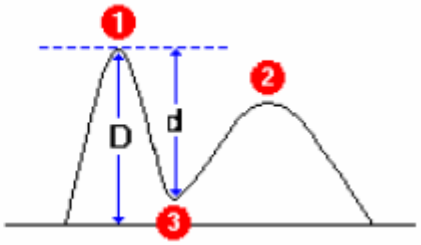
BASO X 直方圖

BASO X 直方圖顯示與 BASO 細胞直方圖的整個 x 軸相對應的事件分布。但是，它僅包含 BASO 細胞直方圖 y 軸上噪音閾值與嗜鹼性粒細胞閾值之間的事件。其中包含 MN（單個核）種群和 PMN（多形核細胞）種群。

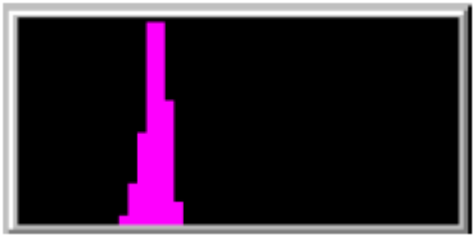
下列參數是從 BASO X 直方圖得出的：

- x 軸上 MN 種群的最頻值通道(MNx)(1)（最頻值通道包含一個特定種群中最大數量的細胞。）
- x 軸上 PMN 種群的最頻值通道(PMNx)(2)
- 隔開 MN/PMN 種群的谷道(3)（谷道包含兩個種群同最少數量的細胞。）
- 谷的相對深度用 d/D 表示(BASO d/D)
- Lobularity Index（分葉核指數，LI）指示檢體異常。以是 BASO X 直方圖上的 PMN 峰道數除以 14 的結果，對於正常檢體來說，應大於 1.9。值低於 1.9 通常表明檢體異常。





BASO Y 直方圖



BASO Y 直方圖顯示 BASO 細胞直方圖 y 軸上從噪音閾值至 49 道的事件分布。但是，它僅包含 BASO 細胞直方圖 x 軸上最高至 MN/PMN 谷道的區域中的事件。其中包含 MN（單個核）種群。

BASO Y 直方圖用來確定 y 軸上 MN 種群的最頻值通道(MNy)。

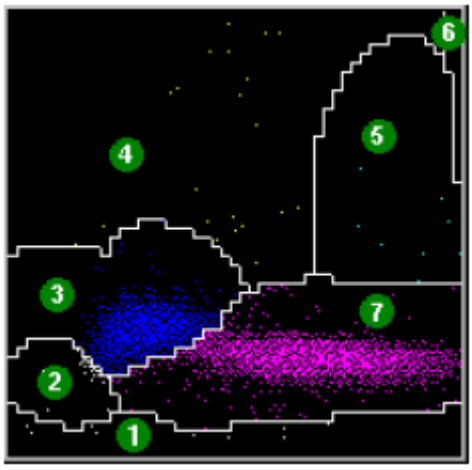
BASO 細胞直方圖：組群分析

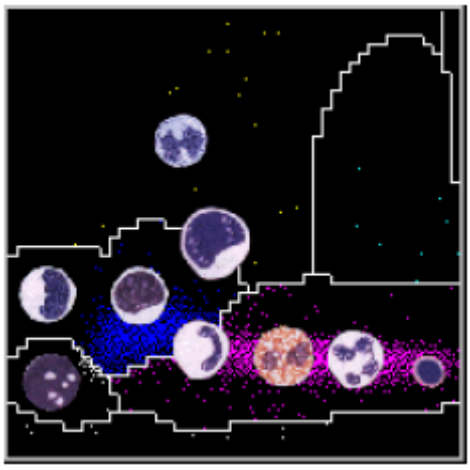
BASO 細胞直方圖每個軸上分爲 50 個計數通道。

當高角度光散射（核配置）繪製在 x 軸上，且低角度光散射（細胞大小）繪製在 y 軸上時，就形成了不同的種群或組群。

組群分析根據每個種群的位置、區域以及密度對其進行識別，然後對每個種群中細胞／細胞核的數量進行計數。

下面的 BASO 細胞直方圖來自於一個有代表性的患者檢體。





1 噪音
2 原始細胞細胞核
3 單個核細胞 WBC（單核細胞細胞核與淋巴細胞細胞核）
4 嗜鹼性粒細胞
5 疑似嗜鹼性粒細胞
6 飽和
7 多形核細胞 WBC（嗜中性粒細胞細胞核與嗜酸性粒細胞細胞核）

Noise（噪音）區

該區域包含血小板、紅血球基質以及未包括在白細胞總計數(WBCB)內的其他細胞碎片：

原始細胞組群

原始細胞如存在，顯示在原始細胞組群中。

單個核組群

在正常檢體中，MN 種群包含淋巴細胞細胞核與單核細胞細胞核。

嗜鹼性粒細胞組群

嗜鹼性粒細胞由於細胞質完整，因此體積比白細胞細胞核大很多，並顯示在嗜鹼性粒細胞組群中。

疑似嗜鹼性粒細胞組群

包含除嗜鹼性粒細胞外的未裂解細胞。得自這一區域的計數不包括在嗜鹼性粒細胞計數內。

飽和區

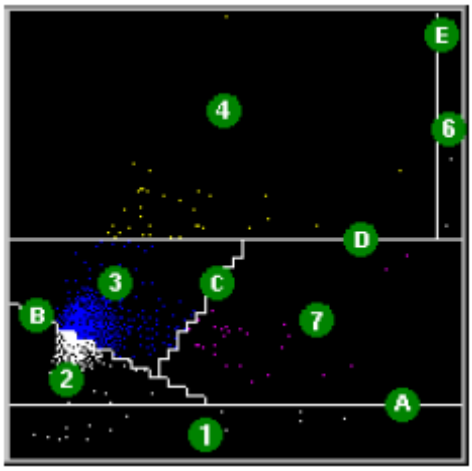
通常該區域包含不包括在嗜鹼性粒細胞計數或 WBCB 計數內的氣泡。

多形核細胞組群

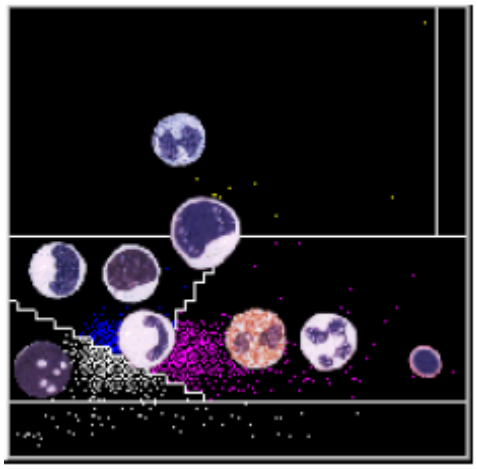
在正常檢體中，PMN 群包含嗜酸性粒細胞細胞核與嗜中性粒細胞細胞核。

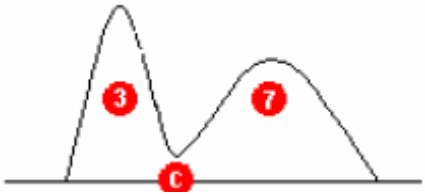
BASO 細胞直方圖：直方圖分析

如果由於細胞計數過低導致組群分析與正常原型不符，或只有一個可識別細胞群時，用直方圖分析來識別以下細胞群：嗜鹼性粒細胞、MN（單個核細胞）、PMN（多形核細胞）、原始細胞、噪音以及嗜鹼性粒細胞飽和區。



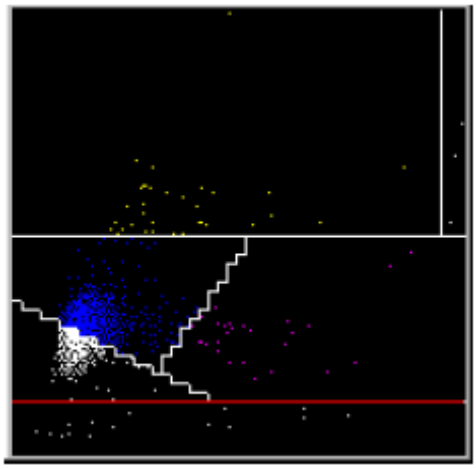
A 嗜鹼性粒細胞噪音閾值
B 原始細胞閾值
C MN/PMN 谷閾值
D 嗜鹼性粒細胞閾值
E 嗜鹼性粒細胞飽和閾值
1 噪音細胞核
2 原始細胞
3 單核 WBC（單核細胞細胞核與淋巴細胞細胞核）
4 嗜鹼性粒細胞
5 未使用
6 飽和
7 多形核細胞 WBC（嗜中性粒細胞細胞核與嗜酸性粒細胞細胞核）





BASO X 直方圖

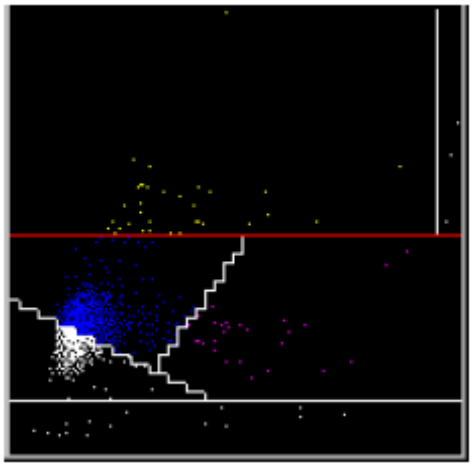
嗜鹼性粒細胞噪音閾值



該閾值（顯示爲紅線）設置在 y 軸的 4 道。

該閾值下的事件被計數爲噪音，而其上的細胞被包括在白細胞計數(WBCB)中。

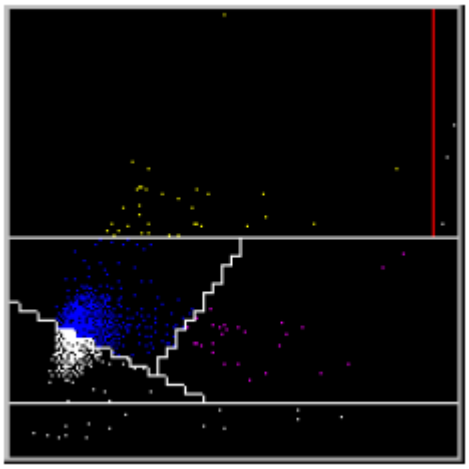
嗜鹼性粒細胞閾值



該閾值（顯示爲紅線）將嗜鹼性粒細胞與其他類型細胞的細胞核分隔開來。

該閾值設置在 y 軸上的 21 道。該閾值上的所有細胞都作爲嗜鹼性粒細胞計數。

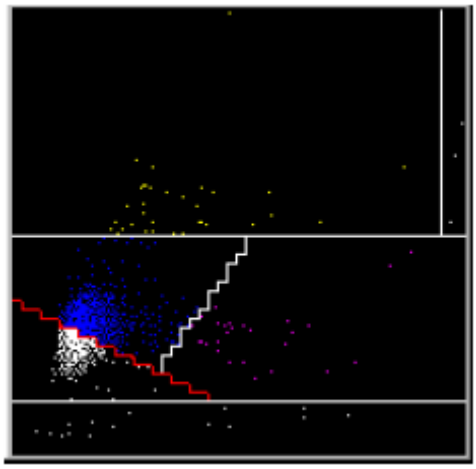
嗜鹼性粒細胞飽和閾值



該閾值（顯示爲紅線）設置在 x 軸上的 45 道和 y 軸上的 21 道。

該區域內的事件（小氣泡、凝集細胞以及未裂解細胞）會受到監視，以備進行標記。

原始細胞閾值

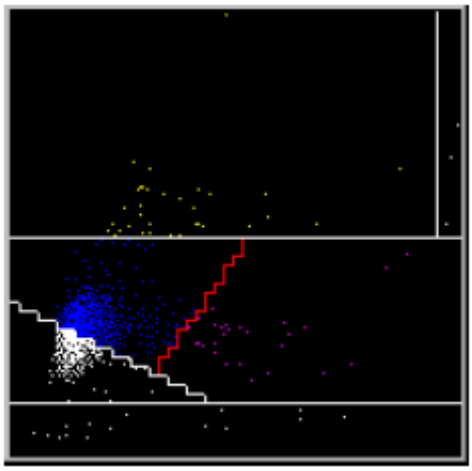


該閾值（顯示爲紅線）設置在 x 軸上的 8 道和 y 軸上的 4 道與 21 道之間。

所有低於該閾值的細胞（在左側）被計數爲原始細胞，會受到監視，僅供標記之用。

原始細胞計數不應作爲患者結果報告。

MNIPMN 閾值

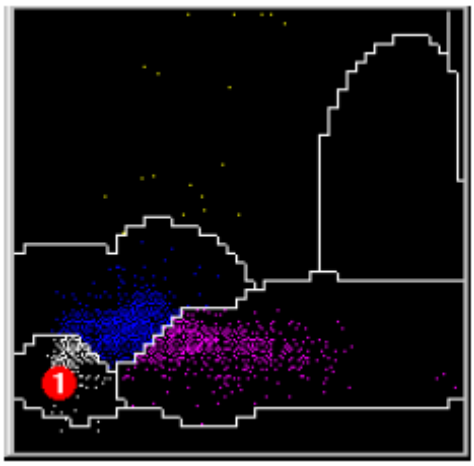


該”谷”閾值（顯示爲紅線）將單個核細胞(MN)群與多形核細胞(PMN)群分隔開。該谷閾值是使用 Baso X 直方圖設定的浮動閾值。

異常細胞位置

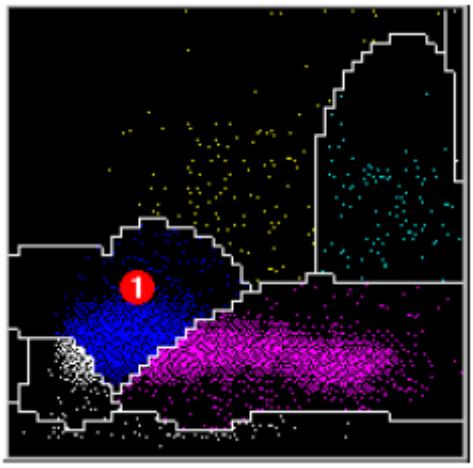
如果出現異常細胞，其大小及核配置確定其信號在 BASO 細胞直方圖上的位置。點擊下方的細胞直方圖按鈕查看異常細胞會在何處出現。

原始細胞在 BASO 細胞直方圖上的位置



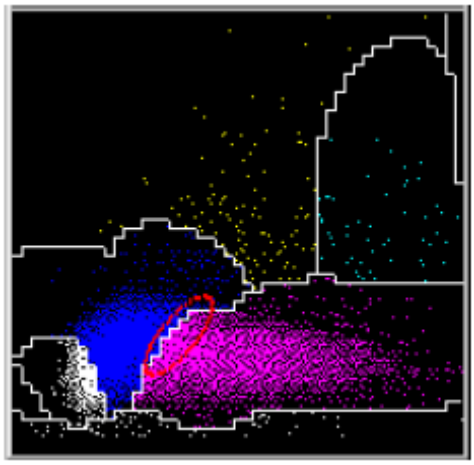
原始細胞顯示在BASO細胞直方圖的 Blast（原始細胞）區(1)。

異常淋巴細胞在 BASO 細胞直方圖上的位置



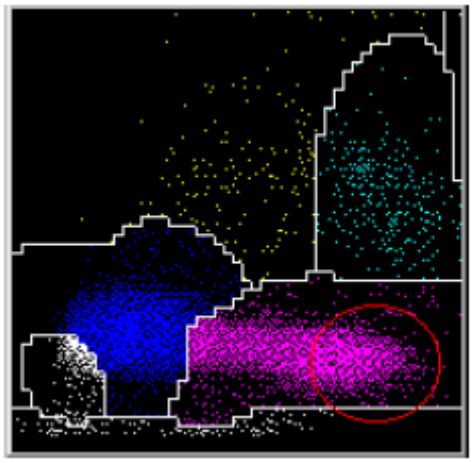
異常淋巴細胞顯示在BASO細胞直方圖的單個核(MN)區(1)內。

未成熟粒細胞在 BASO 細胞直方圖上的位置



未成熟粒細胞顯示在BASO細胞直方圖的 MN 區內。

有核紅血球在 BASO 細胞直方圖上的位置

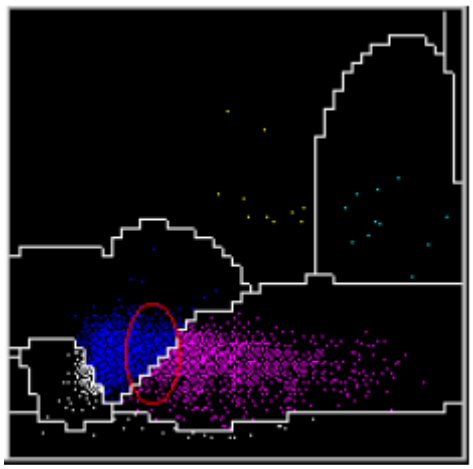


有核紅血球 (NRBC) 顯示在 BASO 細胞直方圖的 PMN 群內。但在過氧化物酶染色方法中，NRBC 僅供警示之用。

系統使用來自 perox 通道和 baso 通道的數據得出。

有核紅血球(NRBC)計數（%NRBC 和#NRBC）。如果存在 NRBC，系統糾正 WBC 結果來對其進行說明。

杆狀核細胞在 BASO 細胞直方圖上的位置



杆狀核細胞顯示在單個核(MN)與多形核細胞(PMN)群之間。

計算參數

報告的參數

下列參數可用於患者報告：

參數	說明
WBCB	RawWBC x (BasoCalFactor ÷ [1 – FracDT])
%BASO	100 x（BASO 計數 ÷ BASO PHA 細胞）
#BASO	(%BASO ÷ 100) x WBCB

系統使用來自 perox 通道和 baso 通道的數據得出有核紅血球(NRBC)計數（%NRBC 和 #NRBC）。如果存在 NRBC，系統糾正 WBC 結果來對其進行說明。

其他參數

下列參數僅用於研究或實驗室用途，不作爲患者結果：

參數	說明
%BASO Suspect	100 x (BASO Suspect ÷ BASO PHACells)
%BLAST	100 x (Blasts ÷ BASO PHA Cells)
%MN	100 x (MN ÷ BASO PHACells)
%PMN	100 x (PMN ÷ BASO PHACells)
%PMN Ratio	%PMN ÷ (%NEUTS + %EOS)
BASO% Dead Time	100 x FracDT
BASO% Noise	100 x (Noise ÷ BASO PHA Cells)
BASO %	100 x (BASO Saturation ÷ BASO PHA Saturation Cells)
BASO Flatness	$\sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$
LI	PMNx ÷ MNx
MNx	單核組群的峰 X 道
MNy	單核組群的峰 Y 道
PMNx	多形核細胞組群的峰 X 道

參數說明

WBCB
從嗜鹼性粒細胞／分葉核方法得出的白細胞計數

#BASO
嗜鹼性粒細胞的絕對計數

%BASO
嗜鹼性粒細胞的百分比

%BASO Suspect
來自 Baso Suspect（疑似嗜鹼性粒細胞）區的事件的百分比

%MN
來自 Mononuclear（單個核）區的事件的百分比

%PMN
來自 Polymorphonuclear（多形核細胞）區的事件的百分比

%PMN Ratio
多形核細胞事件百分比與從過氧化物酶染色方法得到的 NEUTS 和 EOS 百分比的比率

BASO % Dead Time
通道忙無法檢測流通池事件時的分析時間的百分比

BASO % Noise
來自 Noise（噪音）區的事件的百分比

BASO % Saturation
來自 Saturation（飽和）區的事件的百分比

LI
分葉核指數

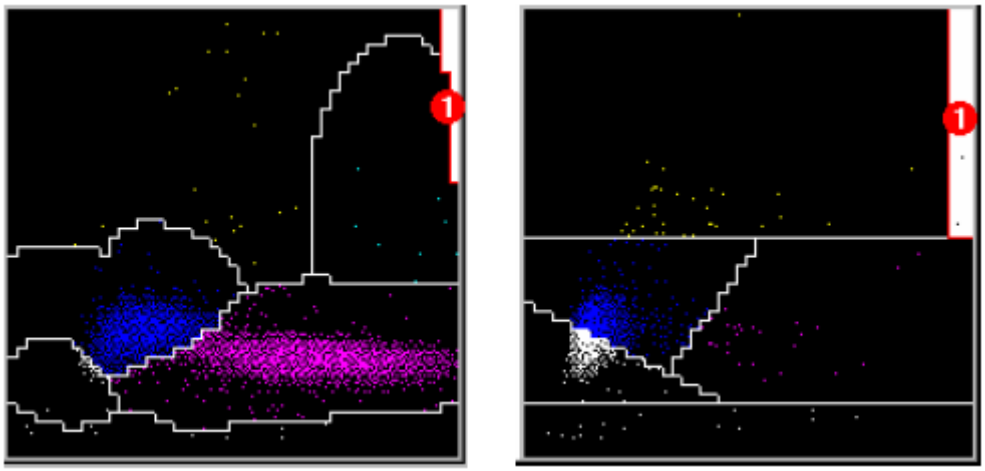
% Blast
來自 Blast（原始細胞）區的事件的百分比

BASO PHA Cells (B-acq)
BASO 細胞直方圖中除 Noise（噪音）區外所有事件的數量。

BASO PHA Tota (B-tot)
BASO 細胞直方圖中包括 Noise（噪音）區在內所有事件的數量。

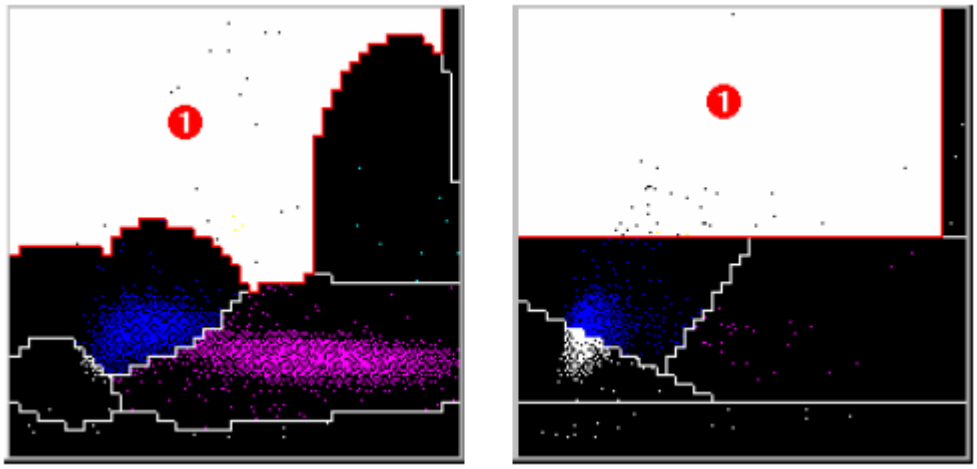
BASO Valid Cells (B-vc)
從流通池事件檢測到的有效電脈衝信號的數量。

BASO Saturation
BASO 細胞直方圖 Saturation（飽和）區(1)中事件的數量。



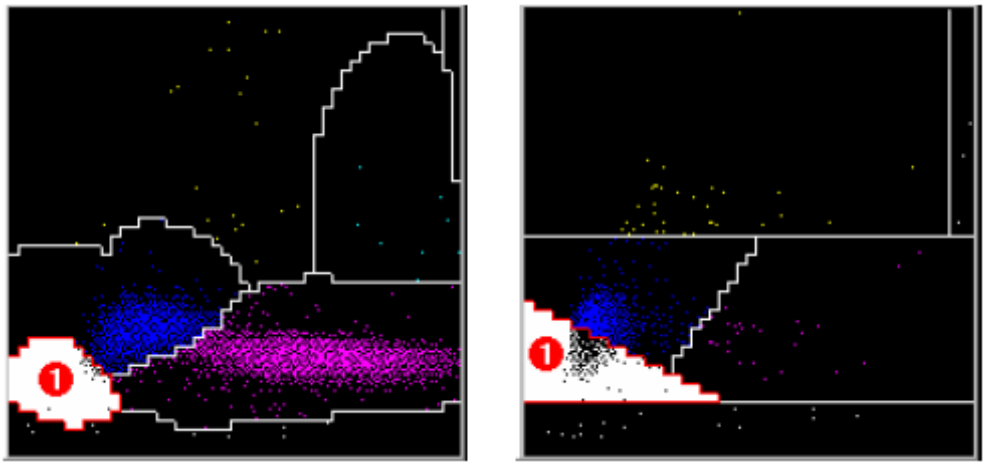
BASO Count

BASO 細胞直方圖 Baso 區(1)中細胞的數量。



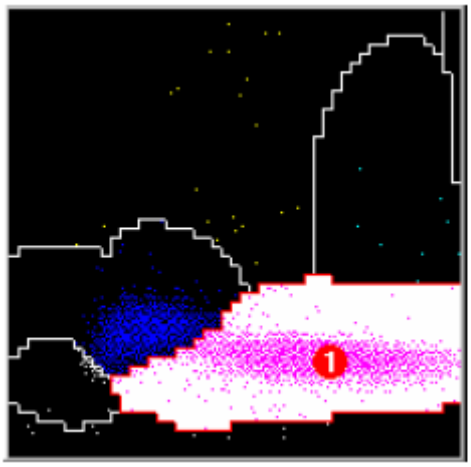
Blasts

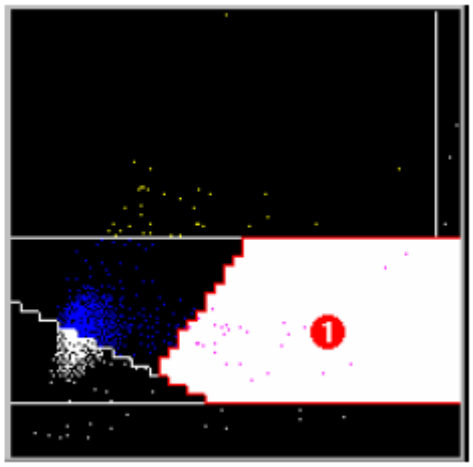
BASO 細胞直方圖 Blast（原始細胞）區(1)中事件的數量。



PMN

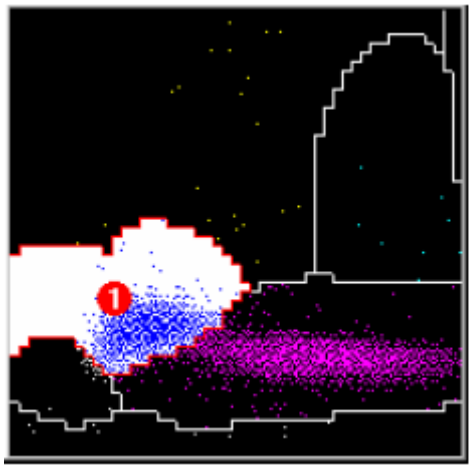
BASO 細胞直方圖 PMN 區(1)中事件的數量。

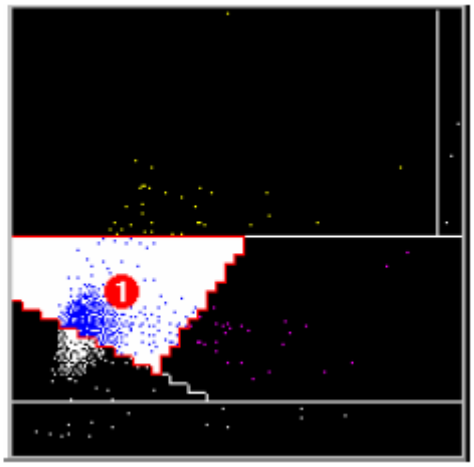




MN

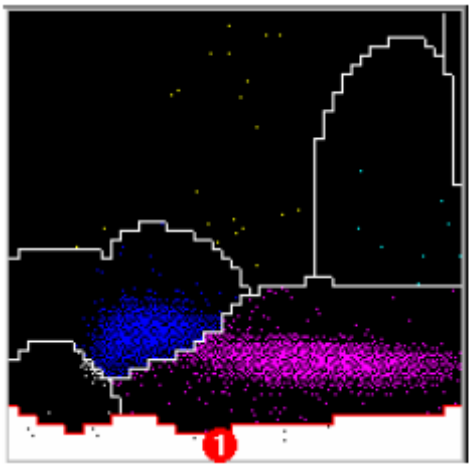
BASO 細胞直方圖 MN 區(1)中事件的數量。

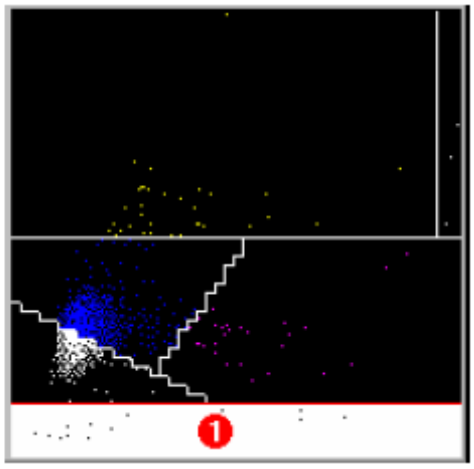




Noise

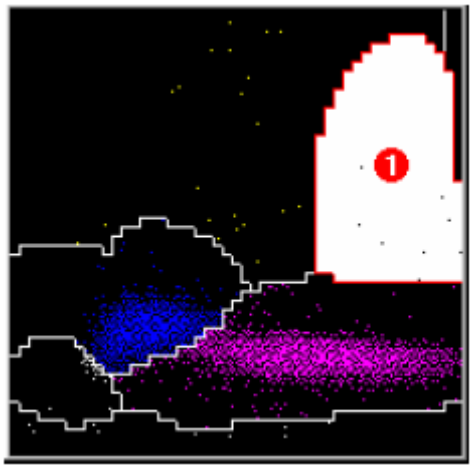
BASO 細胞直方圖 Noise（噪音）區(1)中事件的數量。





BASO Suspect

BASO 細胞直方圖 BASO Suspect（疑似嗜鹼性粒細胞）區(1)中事件的數量。



RawWBC

BASO Valid Cellsx (BASO PHA Cells ÷ BASO PHA Total)

BasoCalFactor

進樣器一特定校正係數：

BasoCalFactor = BASO WBC (AS) x 0.0012475

BasoCalFactor = BASO WBC (MCTS) x 0.0012475

BasoCalFactor = BASO WBC (OTS) x 0.0012475

要查看 BASO WBC 校正係數，在 System Logs（系統日誌）菜單上單擊 **Cal/Gain Logs（校正／Gain 日誌）**。

FracDT

通道忙於處理流通池事件的時間段。當嗜鹼性粒細胞通道忙於標示特定流通池事件時，無法處理可能出現的任何其他事件。通過測量這段”死時間”，分析儀可以對這些事件做出校正。

腦脊液 CSF 方法

細胞化學反應

ADVIA 2120/2120i CSF 分析儀通過對某些細胞類型進行計數和區分，提供快速、自動的 CSF 檢體分析。使用 ADVIA 2120/2120i CSF 分析儀時，CSF 檢體與 ADVIA 2120/2120i CSF 試劑混合，包裹並固定細胞。經過最少 4 分鐘至 4 小時的培育期後，備好的檢體被直接吸取到 ADVIA 2120/2120i 分析儀中。

測量

ADVIA 2120/2120i CSF 分析儀通過對某些細胞類型進行計數和區分，提供快速、自動的 CSF 檢體分析。使用 ADVIA 2120/2120i CSF 分析儀時，CSF 檢體與 ADVIA 2120/2120i CSF 試劑混合，包裹並固定細胞。經過最少 4 分鐘至 4 小時的培育期後，備好的檢體被直接吸取到 ADVIA 2120/2120i 分析儀中。然後使用 ADVIA 2120/2120i 激光光學器件基於光散射和吸收測量對細胞進行檢測和計數。會顯示散射與散射以及散射與吸收直方圖，並且爲每個檢體自動計算閾值和結果（請參見圖 1 和圖 2）。可報告參數爲 WBC 計數和 RBC 計數，以及嗜中性粒細胞、淋巴細胞、單核細胞、多形核細胞(PMN)和單個核(MN)細胞的絕對計數與百分比計數。還會給出僅供研究使用的嗜酸性粒細胞計數。

CSF Scatter/Scatter (CSF 散射／散射）細胞直方圖

CSF Scatter/Scatter (CSF 散射／散射）細胞直方圖，是 100x100 道的、二維的 WBC、RBC 及噪音的高散射數據和低散射數據的脈衝高度分布，其中 X 軸是高角度散射，而 Y 軸是低角度散射。使用固定屏來設定嗜中性粒細胞、淋巴細胞、單核細胞以及紅血球區域的閾值。嗜酸性粒細胞屬於該細胞直方圖的 Neutrophil（嗜中性粒細胞）區。嗜酸性粒細胞的數量由 Scatter/Absorption（散射／吸收）細胞直方圖確定，並在計算 WBC 參數及 Neutrophil（嗜中性粒細胞）參數前從 Neutrophil（嗜中性粒細胞）區的細胞數中扣除。此時，嗜酸性粒細胞數據僅供研究使用，不用於報告。

CSF Scatter/Absorption (CSF 散射／吸收）細胞直方圖

CSF Scatter/Absorption (CSF 散射／吸收）細胞直方圖是 100x100 道、二維的 WBC、RBC 及噪音的高散射數據和吸收數據的脈衝高度分布，其中 X 軸是吸收，而 Y 軸是高角度散射。使用固定屏來設定嗜酸性粒細胞分析的閾值。由於其吸收更高，因此在此細胞直方圖中，嗜酸性粒細胞位於嗜中性粒細胞群的右側，從而能夠和嗜中性粒細胞群分隔開來。在計算 WBC 參數及 Neutrophil（嗜中性粒細胞）參數前，要將嗜酸性粒細胞數量從 Scatter/Scatter（散射／散射）細胞直方圖 Neutrophil（嗜中性粒細胞）區的細胞數中扣除。

計算參數

報告的參數

下列參數可用於患者報告：

參數	說明
CSF WBC	CSF WBC/μL = (CSF PHA WBC/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
%CSF PMN	%CSF PMN = 100 x CSF PMN/CSF WBC
#CSF PMN	#CSF PMN/μL = (CSF PHA PMN/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
%CSF MN	%CSF MN = 100 x CSF MN/CSF WBC
#CSF MN	#CSF MN/μL = (CSF PHA MN/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
%CSF Neut	%CSF Neut = 100 x CSF Neut/CSF WBC
#CSF Neut	#CSF Neut/μL = (CSF PHA Neut/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
%CSF Lymph	%CSF Lymph = 100 x CSF Lymph/CSF WBC
#CSF Lymph	#CSF Lymph /μL = (CSF PHA Lymph/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
%CSF Mono	%CSF Mono = 100 x CSF Mono/CSF WBC
#CSF Mono	#CSF Mono/μL = (CSF PHA Mono/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
CSF RBC	CSF RBC/μL = (CSF R Count/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor

其它參數

下列參數僅用於研究或實驗室用途，不用於患者報告：

參數	說明
%CSF Eos	%CSF Eos = 100 x CSF Eos/CSF WBC
#CSF Eos	#CSF Eos/μL = (CSF PHA Eos/CSF PHA Total x CSF PHA Cells)/(1-Fractional Dead Time) x Perox Nominal Factor
CSF PHA Total	CSF Scatter/Scatter(CSF 散射／散射）細胞直方圖中包括噪音區在內顯示的細胞總數。
CSF PHA Cells	CSF Scatter/Scatter(CSF 散射／散射）細胞直方圖中效噪音區外顯示的細胞總數。
CSF %Noise	位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖噪音區中的細胞的百分比。
CSF PHA WBC	位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖 WBC 區的細胞的數量。
CSF PHA Eos	位於 CSF Scatter/Absorption（CSF 散射／吸收）細胞直方圖 Eosinophil（嗜酸性粒細胞）區的細胞的數量。
CSF PHA Lymphs	位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖 LymPhocyte（淋巴細胞）區的細胞的數量。
CSF PHA Monos	CSF PHA Monos 是位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖 Monocyte（單核細胞）區的細胞的數量。
CSF PHA Neuts	位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖 Neutrophil（嗜中性粒細胞）區的細胞的數量。由於其散射／散射屬性，嗜中性粒細胞和嗜酸性粒細胞都位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖的這一區域中。CSF PHA Eos 的數量標示在 CSF Scatter/Absorption（CSF 散射／吸收）細胞直方圖的 Eosinophil Region（嗜酸性粒細胞區），要將其從 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖 Neutrophil Region（嗜中性粒細胞區）的細胞數量中減去，以確定 CSF PHA Neuts。 CSF PHA Neuts = # cells in Neutrophil Region (CSF Scatter/Scatter Cytogram) - CSF PHA Eos (CSF Scatter/Absorption Cytogram)
CSF R Count	位於 CSF Scatter/Scatter（CSF 散射／散射）細胞直方圖 Red Cell Region（紅血球區）的細胞的數量。

參數說明

CSF WBC
可報告 CSF 白細胞計數(WBC/μL)。

#CSF PMN
可報告 CSF 多形核細胞絕對計數。

%CSF PMN
可報告 CSF 多形核細胞分類百分比計數。

#CSF MN
可報告 CSF 單個核細胞絕對計數。

%CSF MN
可報告 CSF 單個核細胞分類百分比計數。

#CSF Neut
可報告 CSF 嗜中性粒細胞絕對計數。

%CSF Neut
可報告 CSF 嗜中性粒細胞分類百分比計數。

#CSF Lymph
可報告 CSF 淋巴細胞絕對計數。

%CSF Lymph
可報告 CSF 淋巴細胞分類百分比計數。

#CSF Mono
可報告 CSF 單核細胞絕對計數。

%CSF Mono
可報告 CSF 單核細胞分類百分比計數。

CSF RBC
可報告 CSF 紅血球計數(RBC/μL)。

CSF WBC
可報告 CSF 白細胞計數(WBC/μL)。

#CSF PMN
可報告 CSF 多形核細胞絕對計數。

%CSF PMN
可報告 CSF 多形核細胞分類百分比計數。

#CSF MN
可報告 CSF 單個核細胞絕對計數。

%CSF MN
可報告 CSF 單個核細胞分類百分比計數。

#CSF Neut
可報告 CSF 嗜中性粒細胞絕對計數。

%CSF Neut
可報告 CSF 嗜中性粒細胞分類百分比計數。

#CSF Lymph
可報告 CSF 淋巴細胞絕對計數。

%CSF Lymph
可報告 CSF 淋巴細胞分類百分比計數。

#CSF Mono
可報告 CSF 單核細胞絕對計數。

%CSF Mono
可報告 CSF 單核細胞分類百分比計數。

CSF RBC
可報告 CSF 紅血球計數(RBC/ μL)。

%CSF Eos
只用於研究用途的 CSF 嗜酸性粒細胞分類百分比計數。

#CSF Eos
只用於研究用途的 CSF 嗜酸性粒細胞絕對計數。

血紅素方法

化學反應

正常情況下，ADVIA 2120/2120i 血液分析儀使用無氨

血紅素方法，但可以配置爲使用含氰化物的試劑。

檢體和 ADVIA 2120/2120i CN - FREE HGB 試劑或 ADVIA 2120/2120i HGB 試劑在血紅素反應池（比色計）中混合。血紅素化學反應包括兩個步驟：

ADVIA CN - FREE HGB 試劑

步驟 1 裂解紅血球釋放血紅素

步驟 2 血紅素中的血色素鐵從二價鐵被氧化爲三價鐵狀態，並將一個氫氧離子和一個水分子配位成一個軸向配體，形成反應生成物 monoaquomonohydroxyferri-porphyrin。

ADVIA HGB 試劑

步驟 1 裂解紅血球釋放血紅素。

步驟 2 血紅素中的血色素鐵從二價鐵被氧化爲三價鐵狀態，然後與 ADVIA 2120/2120i HGB 試劑中的氰化物結合形成反應生成物。

ADVIA 2120 1 21201 HGB

注意：有關 ADVIA 2120/2120i HGB 試劑內容物的更詳細訊息，請參見第 8 章。

ADVIA 2120/2120i HGB 試劑包含表面活性劑和氰化鐘，可溶解於 pH 值為 11.3 的碱性溶液中。

表面活性劑使紅血球溶血，然後將細胞碎片和脂類乳化在本不混濁的反應混合物中。

在通過溶血釋放血紅素後，碱性 pH 值和表面活性劑的共同作用導致蛋白質快速變性，同時表面活性劑膠束導致血色素增溶。

然後，血色素經受空氣氧化由二價鐵變爲三價鐵狀態，並與氰化物結合形成膠束狀高鐵血紅素。已發表研究表明，每個高鐵血紅素與兩個氰離子結合。

Siemens 血紅素方法的機制和臨床效果已進行了描述。碳氧血紅素的存在（即便高達 100%）對氰化產物的反應率或轉化沒有影響。

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Malin MJ, Sclafani LD and Wyatt JL: Evaluation of 24-second cyanidecontaining and cyanide-free methods for whole blood hemoglobin on the Technicon H-1 analyzer with normal and abnormal blood samples. *Am J Clin Path* **92**: 286 (1989)

Malin MJ, Fan SS and Benezra J: Mechanism of automated alkaline methods for the determination of hemoglobin in whole blood based on the micellization of ligated heme in the presence and absence of cyanide. *Anal Chim Acta* **262**: 67 (1992)

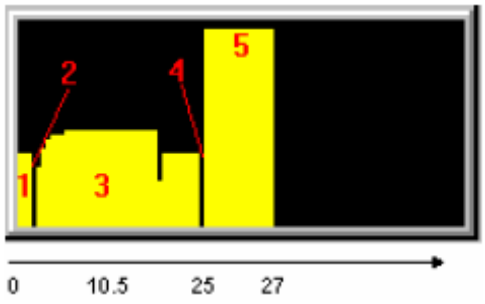
測量

根據所安裝方法，用比色法獲取的光學讀數力 565 或 546 nm。

處理後，光學數據被描繪在血紅素率曲線上，該曲線的 x 軸表示以秒計算的時間，y 軸表示光透射百分比。

血紅素透射直方圖分爲 5 個部分：

HGB Trans



1. 前一周期的 ADVIA 2120/2120i 鞘液／沖洗液讀數
2. 排空 ADVIA 2120/2120i 鞘液／沖洗液，並重新加入由檢體和 ADVIA 2120/2120i HGB 試劑組成的反應液
3. 反應液讀數（15.5s 至 18.0s）一檢體均值
4. 排空反應液，重新加入 ADVIA 2120/2120i 鞘液／沖洗液
5. 當前檢體的 ADVIA 2120/2120i 鞘液／沖洗液讀數（基準透射值）一基準均值底在 2.5 至 4.1 之間。



檢體讀數(3)：檢體和 ADVIA 2120/2120i HGB 試劑

$$\text{檢體均值} = \frac{\Sigma \text{樣本計數}}{N}$$

基準讀數(5): ADVIA 2120/2120i 鞘液／沖洗液

$$\text{檢體均值} = \frac{\Sigma \text{基礎計數}}{N}$$

計算參數

報告的參數

下列參數可用於患者報告：

參數	說明
HGB	日誌（檢體均值 ÷ 基礎均值）x 血紅素校正係數 x 50.0
MCH	(HGB ÷ 十 RBC) x 10
MCHC	(HGB ÷ [RBC x MCV]) x 1000

其他參數

下列參數僅用於研究或實驗室用途，不作爲患者報告：

參數	說明
Calculated HGB（計算後 HGB）	(CHCM x RBC x MCV) ÷ 1000
Delta HGB	HGB－計算後 HGB
HGB Baseline Transmission（HGB 基準透射值）	基準均值 x 3.05194E – 4
HGB Sample Transmission（HGB 檢體透射值）	檢體均值 x 3.05194E – 4
HGB Baseline Flatness（HGB 基準值准均勻度）	最大基準值一最小基
HGB Sample Flatness（HGB 檢體值本均勻度）	最大檢體值一最小樣

參數說明

HGB
實測血紅素濃度

MCH
紅血球血紅素均值

MCHC
平均紅血球血紅素濃度

用 CHCM 計算 HGB 結果

Corpuscular Hemoglobin Concentration Mean（紅血球血紅素濃度均值，CHCM）和 Mean Corpuscular Hemoglobin Concentration（平均紅血球血紅素濃度，MCHC），都提供了對檢體中紅血球血紅素的平均濃度的測量方法。CHCM 是基於逐個細胞分析直接測得的參數，而 MCHC 是基於 HGB、MCV 和 RBC 結果計算出的參數。

如果其差異高出 1.9g/dL，會出現 Comparison Error MCHC/CHCM（比較錯誤 MCHC/CHCM，CHCMCE）檢體／系統標記，警告操作者，出現的狀況可能導致用於計算 MCHC 的 3 個結果（RBC、MCV 和 HGB）中的一個或多個受影響。

例如，血脂過高就是一個已知干擾，可能使由血紅素比色方法獲得的 HGB 結果虛升。血紅素假性增加時，MCHC 也會假性增加。

使用 CHCM 計算 HGB 可避免這種干擾，這是由於 CHCM 是直接測量的，從根本上不受血脂的影響。要計算 HGB，用 CHCM 代替 MCHC，如下：

MCHC = (HGB ÷ [RBC x MCV]) x 1000

HGB = (MCHC x RBC x MCV) ÷ 1000

計算後 HGB = (CHCM x RBC x MCV) ÷ 1000 或(CHCM x Hct) ÷ 100

實測 HGB 和計算的 HGB 值顯示在 Run Screen（運行屏幕）的 HGB 面板上。

進氧化物酶染色方法

細胞化學反應

過氧化物酶細胞化學反應包含 3 個步驟：

步驟 1 利用反應池中的高溫和 ADVIA 2120/2120i PEROX 1 試劑裂解紅血球。

步驟 2 使用 ADVIA 2120/2120i PEROX 1 試劑固定白細胞。

步驟 3 用 ADVIA 2120/2120i PEROX 2 試劑以和 ADVIA 2120/2120i PEROX 3 試劑爲白細胞染色。

基於大小和過氧化物酶反應（染色）的不同強度標示白細胞。

嗜中性粒細胞、嗜酸性粒細胞和單核細胞基於其過氧化物酶活性水平被染色。由於淋巴細胞、嗜鹼性粒細胞和大的不染色細胞不含過氧化物酶，因此這些類型的細胞保持不染色。

Perox 溫度控制

溫度控制對裂解紅血球非常關鍵。perox 反應池的溫度由分析儀自動監控，必須在 58℃至 72.1℃之間。

要檢查 perox 反應池的溫度，使用 Analyzer Status（分析儀狀態）選項卡。

如需調整 perox 細胞反應池的溫度：

1. 在 Special Procedures（特定操作步驟）菜單中，選擇 **Adjust Lamp/Temp（調整燈／溫度）**。
2. 選擇 **Perox Temperature（Perox 溫度）**。

ADVIA 2120 12120i PEROX 1

注意：有關 ADVIA 2120/2120i PEROX 1 試劑內容物的更詳細訊息，請參見第 8 章。

在已加熱的過氧化物酶反應池中，ADVIA 2120/2120i PEROX 1 是加入全血檢體中的第一個試劑。其功能是裂解紅血球並固定白細胞。

表面活性劑（十二烷基硫酸鈉和 Brij-35）與熱應力結合裂解紅血球。

甲醛固定白細胞。高滲透壓導致白細胞部分收縮和皺縮。這提高了細胞的折光指數，增強了在噪音環境下對淋巴細胞的檢測。

ADVIA 2120 12120i PEROX 2

注意：有關 ADVIA 2120/2120i PEROX 2 試劑內容物的更詳細訊息，請參見第 8 章。

在第二次試劑添加中，將 ADVIA 2120/2120i PEROX 2 和 ADVIA 2120/2120i PEROX 3 加入過氧化物酶反應池。

ADVIA 2120/2120i PEROX 2 中的 4-Chloro-1-naphthol 作爲底物，使 ADVIA 2120/2120i PEROX 3 中的過氧化氫能夠在白細胞顆粒中過氧化物酶活性的源位形成深色沉澱物，如下面的方程式所描述：

$$H_2O_2 + \text{4-chloro-1-naphthol} \xrightarrow{\text{細胞過氧化物酶}} \text{細胞內的深色沉澱物}$$

ADVIA 2120/2120i PEROX 3

注意：有關 ADVIA 2120/2120i PEROX 3 試劑內容物的更詳細訊息，請參見第 8 章。

在第二次試劑添加中，將 ADVIA 2120/2120i PEROX 2 和 ADVIA 2120/2120i PEROX 3 加入過氧化物酶反應池。

ADVIA 2120/2120i PEROX 2 中的 4 - Chloro-1-naphthol 作爲底物，使 ADVIA 2120/2120i PEROX 3 中的過氧化氫能夠在白細胞顆粒中過氧化物酶活性的內源位形成深色沉澱物，如下面的方程式所描述：

$$H_2O_2 + \text{4-chloro-1-naphthol} \xrightarrow{\text{細胞過氧物酶}} \text{細胞內的深色沉澱物}$$

ADVIA 2120/12120i PEROX 鞘液

注意：有關 ADVIA 2120/2120i PEROX 鞘液試劑內容物的更詳細訊息，請參見第 8 章。

ADVIA 2120/2120i PEROX 鞘液有三種重要功能：

- 約束檢體流大小，實現每次只有一個細胞通過觀察區。
- 阻止檢體流與流通池壁之間的接觸。從而防止流通池被阻塞或沾污。
- 提供透明光介質，可通過其明確聚焦檢體流。

測量

來自 Perox 反應池的定容細胞懸液通過流通池時，所有白細胞的吸收（過氧化物酶染色）和前向光散射（大小）簽名都被測量。

當兩種液體流經流通池時 ADVIA 2120/2120i PEROX 鞘液會將檢體流包裹起來。

光散射及光吸收信號被檢測並電子化放大。處理後，有以下可用訊息：

PEROX Rate（PEROX 率）直方圖顯示 Perox 通道中的細胞到達率。

PEROX X 直方圖顯示所有細胞的吸收值。來自噪音區的訊息不包含在內。

PEROX Y 直方圖顯示包括噪音區事件在內的所有事件的光散射值。

Noise-Lymph（噪音—淋巴細胞）直方圖提供噪音、淋巴細胞和大的不染色細胞(LUC)區的光散射值。來自單核細胞、嗜中性粒細胞和嗜酸性粒細胞區的訊息不包含在內。

PEROX 細胞直方圖由成對的光散射與吸收數據組成。組群分析識別單個群。

Perox Rate（Perox 率）直方圖



PEROX Rate（PEROX 率）
直方圖顯示細胞計數率的均勻性。

率直方圖數據包含 50 個點，每 200 毫秒獲取一個。每個點代表前 200 秒中計數的有效細胞數。

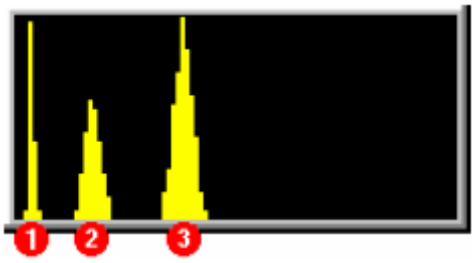
Perox X 直方圖



PEROX X直方圖顯示所有細胞的吸收值。來自噪音區的訊息不包含在內。

隨著 PEROX X 直方圖上道數的增加，對應的過氧化物酶染色的強度越高。

Perox Y 直方圖



PEROX Y直方圖顯示包括噪音區事件在內的所有事件的光散射值。

隨著 PEROX Y 直方圖上道數的增加，對應的細胞大小（體積）也越大。

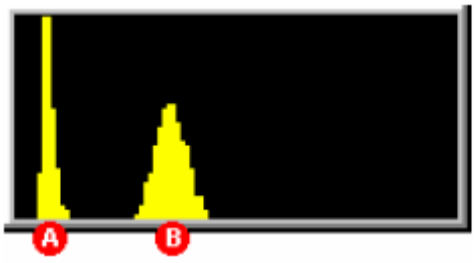
1 噪音
2 淋巴細胞
3 大的不染色細胞(LUC)

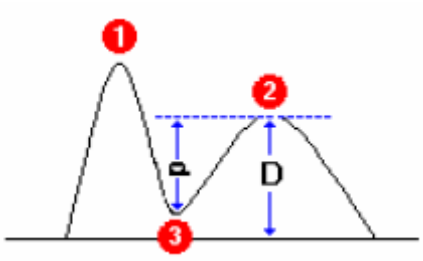
Noise-Lymph（噪音一淋巴細胞）直方圖

Noise-Lymph（噪音一淋巴細胞）直方圖提供噪音、淋巴細胞和大的不染色細胞(LUC)區的光散射值。

Noise-Lymph（噪音一淋巴細胞）直方圖用來得出下列參數：

- y 軸上噪音種群的最頻值道(1)
- y 軸上淋巴細胞群的峰道（淋巴細胞最頻值）(2)
- 隔開噪音群和淋巴細胞群的谷道（噪音一淋巴細胞谷）(3)
- 谷的相對深度用 d/D 表示(PEROX d/D)。





A 噪音
B 淋巴細胞方法

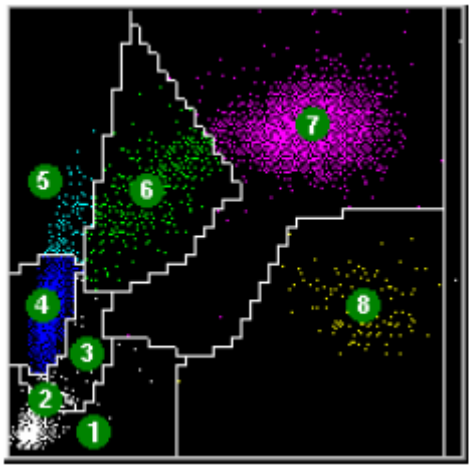
Perox 細胞直方圖

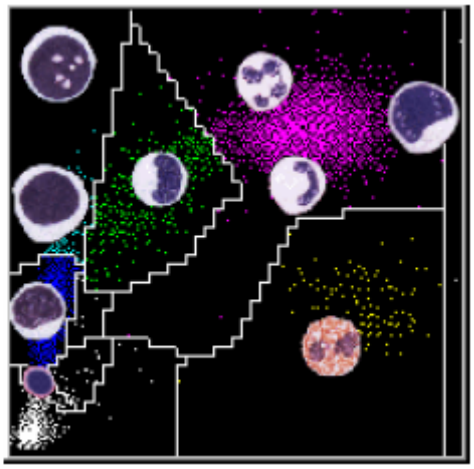
PEROX 細胞直方圖每個軸上分成 100 個計數通道。細胞吸收的光與使用的過氧化物酶染色劑程度成正比，該情況顯示在 x 軸上。細胞散射的光與細胞大小成正比，該情況顯示在 y 軸上。

描繪光散射數據和光吸收數據時，就形成了不同的種群或組群。

組群分析根據每個種群的位置、區域以及密度對其進行識別，然後對每個種群中細胞的數量進行處理。區分不同細胞群的邊界線由軟體根據每個檢體分別計算。

下面的 PEROX 細胞直方圖來自於一個有代表性的患者檢體。





1 噪音
2 有核紅血球
3 血小板凝集
4 淋巴細胞和嗜鹼性粒細胞
5 大的不染色細胞
6 單核細胞
7 嗜中性粒細胞
8 嗜酸性粒細胞

噪音

這一區域包括被排除在白細胞總計數(WBCP)和 WBC 分類之外的血小板、紅血球基質及細胞碎片。

有核紅血球

如存在有核紅血球，它們會顯示在該區域，這是由於其大小較小，而且缺乏過氧化物酶染色。系統使用來自 perox 通道和 baso 通道的數據得出有核紅血球(NRBC)計數（%NRBC 和#NRBC）。如果存在 NRBC，系統糾正 WBC 結果來對其進行說明。

血小板凝集

如果存在血小板凝集，會顯示在該區域。血小板凝集計數不包含在 WBCP 及分類中，但會被監視以供標記之用。

淋巴細胞與嗜鹼性粒細胞組群

淋巴細胞和嗜鹼性粒細胞顯示在同一組群中，是因爲它們大小相近且都沒有過氧化物酶活性。

LUC 組群

LUC 組群包含大的不染色細胞（異常淋巴細胞、原始細胞以及其他異常細胞）。

單核細胞組群

單核細胞是具有一些過氧化物酶活性的中等大小細胞。

嗜中性粒細胞組群

嗜中性粒細胞是有很強過氧化物酶活性的大的細胞。

嗜酸性粒細胞組群

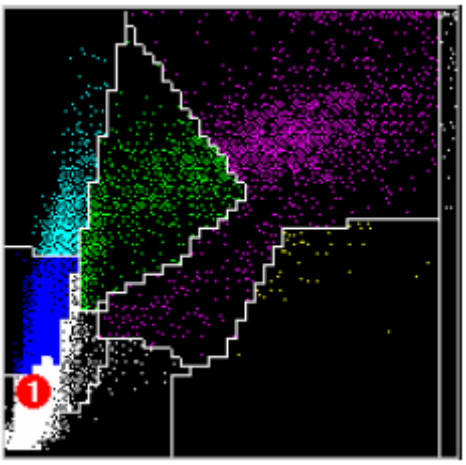
在所有白細胞類型中，嗜酸性粒細胞的過氧化物酶活性最強，它是大的細胞，大小約與嗜中性粒細胞相同。

嗜酸性粒細胞染色非常深以至於會吸收在其他情況下會被散射的光。因此嗜酸性粒細胞看起來比嗜中性粒細胞略小，可以與其區分開來。

異常細胞位置

如果存在異性細胞，其大小及過氧化物酶活性決定了其在PEROX細胞直方圖中的位置。

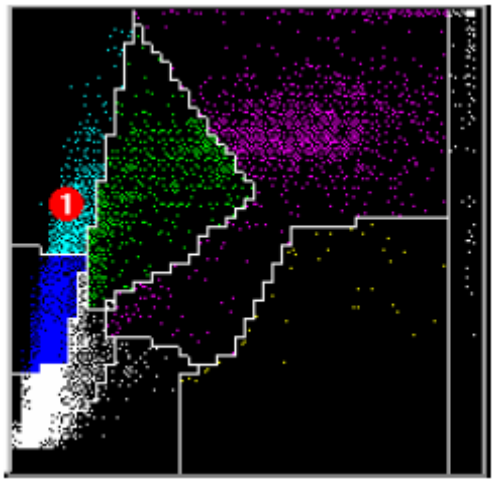
nRBC 在 PEROX 細胞直方圖上的位置



有核紅血球(nRBC)顯示在位於 Noise（噪音）區與 Lymphocyte（淋巴細胞）區之間的 NRBC 組群(1)中。

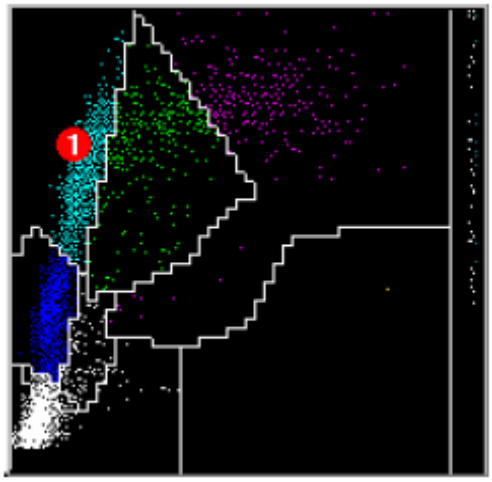
系統使用來自 perox 通道和 baso 通道的數據得出有核紅血球(NRBC)計數（%NRBC 和 #NRBC）。如果存在 nRBC，系統糾正 WBC 結果來對其進行說明。

異常淋巴細胞在 PEROX 細胞直方圖上的位置



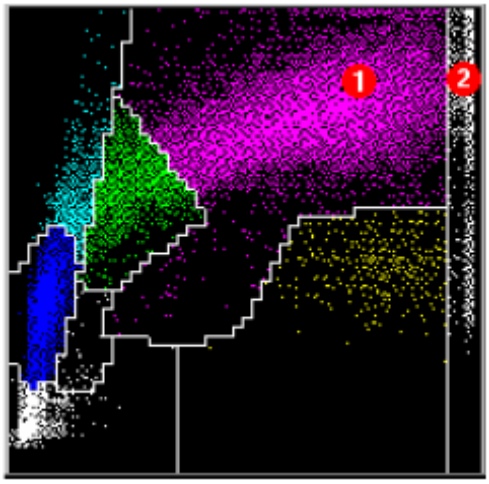
異常淋巴細胞是無過氧化物酶活性的大的細胞，可出現在 LUC 區(1)中。

原始細胞在 PEROX 細胞直方圖上的位置



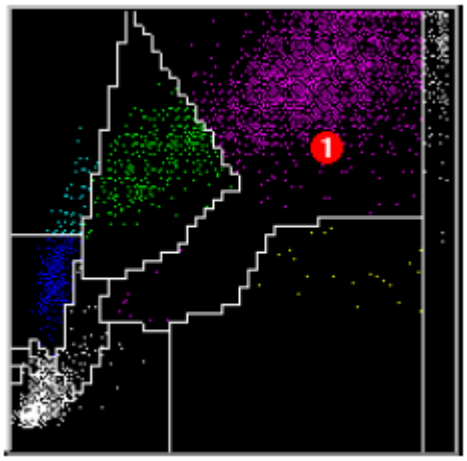
同樣地，**原始細胞**以及其他沒有過氧化物酶活性的大的異常細胞也顯示在 LUC 區(1)中。

未成熟粒細胞在 PEROX 細胞直方圖上的位置



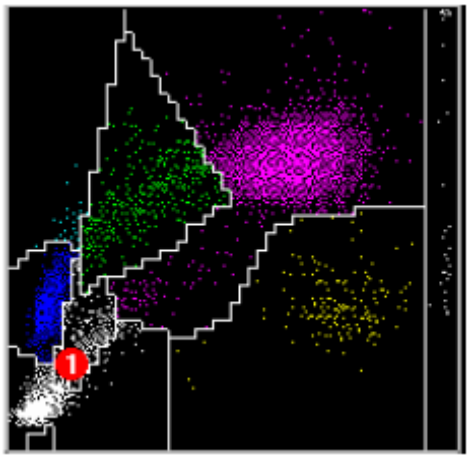
未成熟粒細胞是具有高過氧化物酶活性的大的細胞，可顯示在嗜中性粒細胞區(1)和飽和區(2)中。

杆狀核嗜中性粒細胞在 PEROX 細胞直方圖上的位置



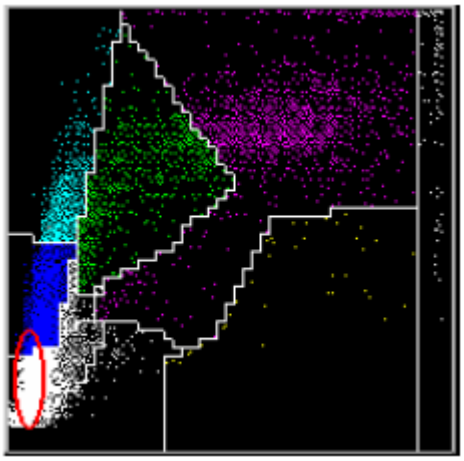
杆狀核嗜中性粒細胞顯示在嗜中性粒細胞群(1)中，這是由它們的大小以及過氧化物酶染色程度決定的。

血小板凝集在 **PEROX** 細胞直方圖上的位置



血小板凝集形成源自 PEROX 細胞直方圖的噪音區的獨立組群 (1)。

未裂解紅血球在 **PEROX** 細胞直方圖上的位置



未裂解紅血球沒有過氧化物酶活性，沿 PEROX 細胞直方圖左側顯示。

計算參數

報告的參數

參數	說明
WBCP	RawWBC x (PeroxCalFactor ÷ [1 - FracDT])
%NEUT	(100 x Neutrophil Count) ÷ PHA Cells
#NEUT	(%NEUT ÷ 100) x WBC
%LYMPH	([100 x Lymphocyte Count] ÷ PHA Cells) - %BASO
#LYMPH	(%LYMPH ÷ 100) x WBC
%MONO	(100 x Monocyte Count) ÷ PHA Cells
#MONO	(%MONO ÷ 100) x WBC
%EOS	(100 x Eosinophil Count) ÷ PHA Cells

#EOS	(%EOS ÷ 100) x WBC
%LUC	(100 x LUC Count) ÷ PHA Cells
#LUC	(%LUC ÷ 100) x WBC

系統使用來自 perox 通道和 baso 通道的數據得出有核紅血球(NRBC)計數（%NRBC 和 #NRBC）。如果存在 nRBC，系統糾正 WBC 結果來對其進行說明。系統還可以顯示 Peroxidase（過氧化物酶）通道和 Basophil/Lobularity（嗜鹼性粒細胞／分葉核）通道 WBC 計數，而且，即便 NRBC 計數已報告，也會顯示未針對 NRBC 進行糾正的相關聯分類計數。未糾正計數由小寫字母“u”標明。

其他參數

下列參數僅用於研究或實驗室用途，不作爲患者結果：

參數	說明
%HPX	100 x (HPX ÷ PHA Cells)
Clumps Count（凝集計數）	PEROX 細胞直方圖的 Platelet Clumps（血小板凝集）區中的事件數
Valley Count（谷計數）	PEROX 細胞直方圖的 NRBC 區中的事件數
Lymph Mode（淋巴細胞最頻值）	淋巴細胞組群的最頻值道
MPXI	$\frac{\text{（檢體 Neut 的 x 均值一預期染色指數）*100}}{\text{預期染色指數}}$
NEUT X	嗜中性粒細胞組群的 X 道均值
NET Y	嗜中性粒細胞組群的 Y 道均值
Noise/Lymph Valley（噪音一淋巴細胞谷）	噪音組群與淋巴細胞組群之間的谷道
Perox d/D	$\frac{\text{淋巴細胞最頻值計數一噪音／淋巴細胞谷計數}}{\text{淋巴細胞最頻值計數}}$
PEROX % Dead Time	100 x FracDT
PEROX % Noise	100 x (Noise ÷ PHA Cells)
PEROX % Saturation	100 x (Peroxsaturation ÷ PHACells)

PEROX Flatness
(PEROX 均勻度)

$$\sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$$

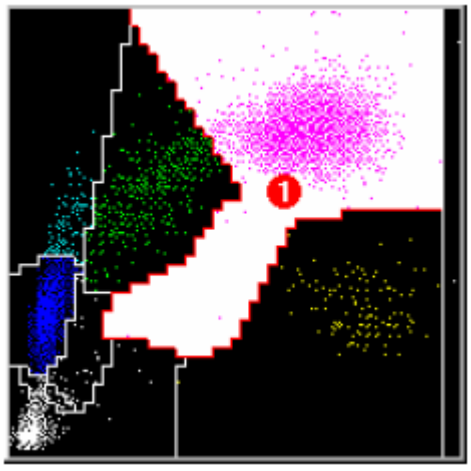
參數說明

WBCP
來自過氧化物酶染色方法的白細胞計數。

%NEUT
嗜中性粒細胞的百分比。

#NEUT
嗜中性粒細胞的絕對計數。

嗜中性粒細胞計數

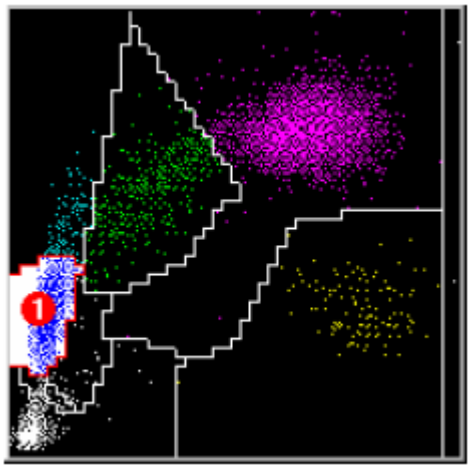


PEROX 細胞直方圖
Neutrophil（嗜中性粒細胞）區(1)
中事件的數量。

%LYMPH
淋巴細胞的百分比。

LYMPH
淋巴細胞的絕對計數。

淋巴細胞計數



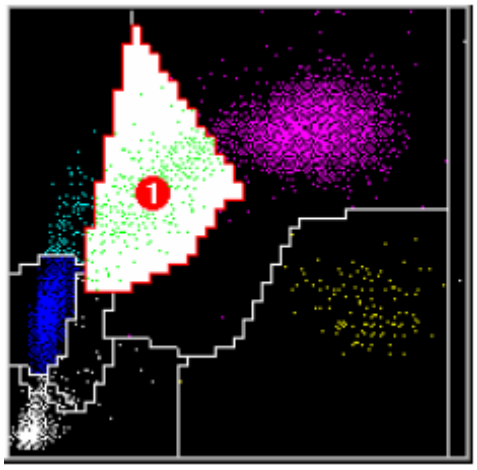
PEROX 細胞直方圖
Lymphocyte（淋巴細胞）區(1)中
事件的數量。

%MONO
單核細胞的百分比。

#MONO

單核細胞的絕對計數。

單核細胞計數



PEROX 細胞直方圖 Monocyte（單核細胞）區(1)中事件的數量。

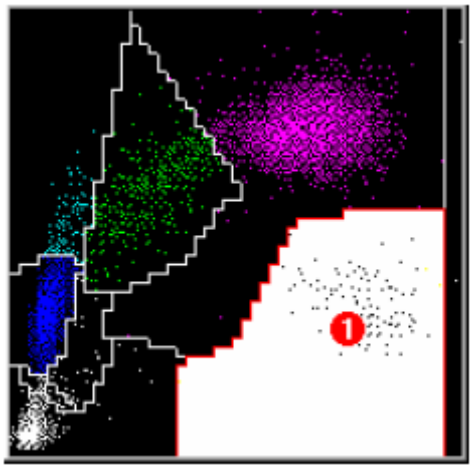
%EOS

嗜酸性粒細胞的百分比。

#EOS

嗜酸性粒細胞的絕對計數。

嗜酸性粒細胞計數



PEROX 細胞直方圖 Eosinophi（嗜酸性粒細胞）區(1)中事件的數量。

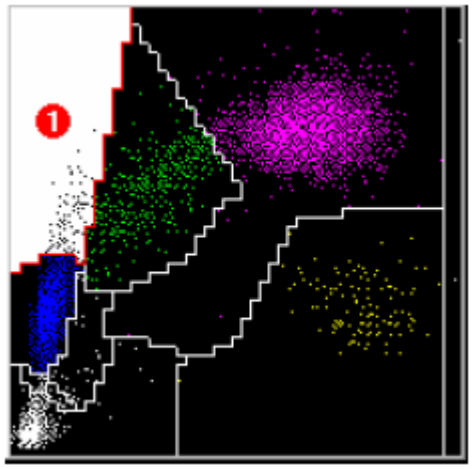
%LUC

大的不染色細胞的百分比。

#LUC

大的不染色細胞的絕對計數。

大的不染色細胞計數



PEROX 細胞直方圖 LUC 區(1)中事件的數量。

RawWBC

Perox Valid Cells x (PHA Cells ÷ PHA Total)

PeroxCalFactor

進樣器特定校正係數：

PeroxCalFactor = PEROX WBC (AS) x 0.001248

PeroxCalFactor = PEROX WBC (MCTS) x 0.001248

PeroxCalFactor = PEROX WBC (OTS) x 0.001248

要查看 PEROX WBC 校正係數，在 System Logs（系統日誌）菜單上選擇 **Cal/Gain Logs（校正／Gain 日誌）**。

FracDT

通道忙於處理流通池事件的時間段。當 perox 通道忙於識別特定流通池事件時，無法處理可能出現的任何其他事件。通過測量這段”死時間”分析儀可以對這些事件做出校正。

MPXI

相對於原型，嗜中性粒細胞群的過氧化物酶活性指數或染色強度均值。

PEROX PHA Cells (P-acq)

PEROX 細胞直方圖中除 Noise（噪音）區外所有事件的數量。

注意：nRBC 和血小板凝結事件是 Perox Noise (Perox 噪音）的組成部分。因此，它們不包括在 PEROX PHA Cells。

PEROX PHA Total (P-tot)

PEROX 細胞直方圖中包括 Noise（噪音）區在內所有事件的數量。

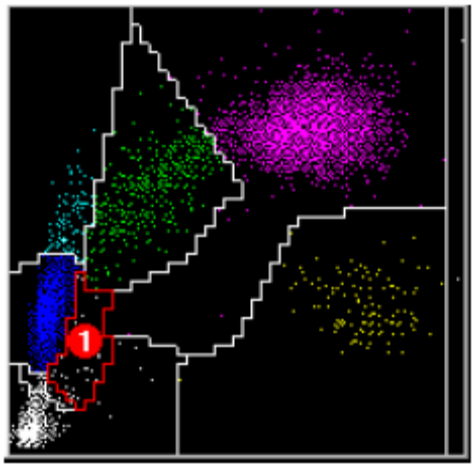
Perox Valid Cells（Perox 有效細胞，P-vc）

從流通池事件檢測到的有效電脈衝信號的數量。

HPX

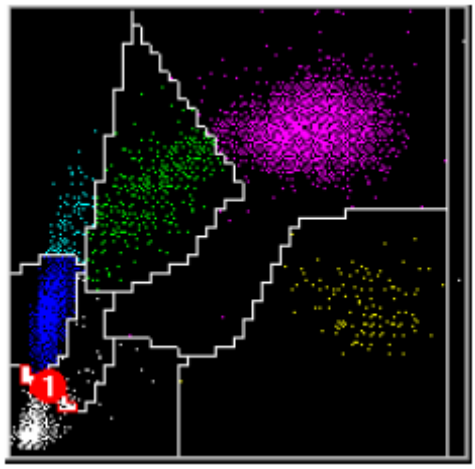
吸收值超過嗜中性粒細胞組群 X 道均值 1.4 倍的事件的數量。

凝集計數



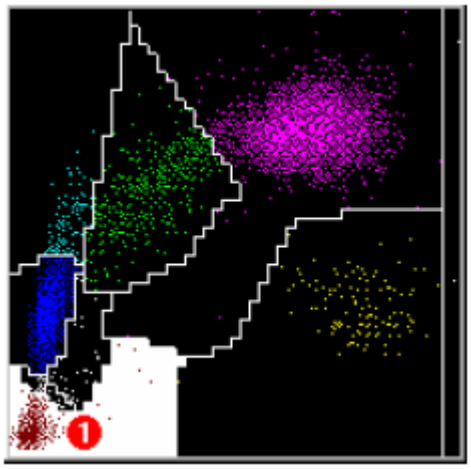
PEROX 細胞直方圖 Platelet Clumps（血小板凝集）區(1)中事件的數量。

谷計數



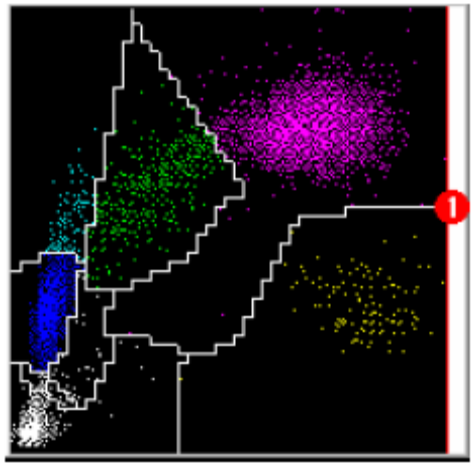
PEROX 細胞直方圖 NRBC 區(1)中事件的數量。

Perox 噪音



PEROX 細胞直方圖的 Noise（噪音）區(1)中事件的數量。

Perox 飽和



PEROX 細胞直方圖 Saturation（飽和）區(1)中事件的數量。

紅血球／血小板方法

細胞化學反應

紅血球／血小板細胞化學反應包含兩個步驟：

步驟 1　用 ADVIA 2120/2120i RBC/PLT 試劑將紅血球和血小板體積球形化。

步驟 2　紅血球和血小板被固定。

ADVIA 2120/2120i RBC/PLT

注意：有關 ADVIA 2120/2120i RBC/PLT 試劑內容物的更詳細訊息，請參見第 8 章。

ADVIA 2120/2120i RBC/PLT 試劑包含十二烷基硫酸鈉(SDS)和戊二醛，能導致紅血球和血小板球化。當紅血球和血小板等體積球形化後，其形狀的變異性就會消除。

測量

來自紅血球反應池的定容細胞懸液通過流通池時，會測量每個細胞的低角度光散射（2˚至 3˚）信號和高角度光散射（5˚至 15˚）信號。

當兩種液體流經流通池時 ADVIA 2120/2120i 鞘液／沖洗液會將檢體流包裹起來。

兩種光散射信號被檢測、電子化放大，並被分成 4 個信號：

- 一對低角度光散射（2˚至 3˚）信號和高角度光散射（5˚至 15˚）信號被用於分析紅血球。
- 一個低角度光散射（2˚至 3˚）信號被放大 30 倍，一個高角度光散射（5˚至 15˚）信號被放大 12 倍。這些信號被用來分析血小板。

測量：紅血球方法

一對低角度光散射（2°至 3°）和高角度光散射（5°至 15°）信號被用於分析紅血球。

使用均勻球對光散射的 Mie（米氏）理論，低角度光散射測量值被轉換爲細胞體積，而高角度光散射測量值被轉換爲血紅素濃度。

下列直方圖和細胞直方圖用於進行紅血球分析：

RBC Rate（RBC 率）直方圖顯示紅血球／血小板通道中的細胞到達率。

RBC Volume（紅血球體積）直方圖按細胞體積顯示紅血球的分布。

RBC HC 直方圖不受細胞體積影響，按血紅素濃度顯示紅血球分布。

RBC CH 直方圖按血紅素含量顯示紅血球的分布。

RBC Scatter（紅血球散射）細胞直方圖是通過沿 x 軸描繪高角度光散射（5°至 15°），沿 y 軸描繪低角度光散射（2°至 3°）而形成的。

RBC V/HC 細胞直方圖呈現用於評估紅血球形態的紅血球體積和血紅素濃度數據。

RBC Matrix（紅血球矩陣）提供 RBCV/HC 細胞直方圖上對應的 9 個區域的細胞計數和細胞百分比。

測量：血小板方法

一個低角度光散射（2°至 3°）信號被放大 30 倍，一個高角度光散射（5°至 15°）信號被放大 12 倍。這些”高 Gain”信號被用來分析血小板。

使用均勻球對光散射的 Mie（米氏）理論，低角度、高 Gain 光散射測量值被轉換爲細胞體積，而高角度、高 Gain 光散射測量值被轉換爲折光指數(n)。

下列直方圖和細胞直方圖用於進行血小板分析：

Platelet X 直方圖由高角度（5°至 15°）、高 Gain 的光散射信號組成。

Platelet X 直方圖由低角度（2°至 3°）、高 Gain 的光散射信號組成。

Platelet Vol（血小板體積）直方圖按細胞體積顯示血小板的分布。

Platelet PM（血小板 PM）直方圖按干質量顯示血小板的分布。

Platelet PC（血小板 PC）直方圖按折光指數顯示血小板的分布。

PLT Scatter（血小板散射）細胞直方圖是通過沿 x 軸描繪高角度（5°至 15°）、高 Gain 光散射，沿 y 軸描繪低角度（2°至 3°）、高 Gain 光散射而形成的。

PLT Volume PC（血小板體積 PC）細胞直方圖是通過在 x 軸描繪血小板的折光指數(PC)，沿 y 軸描繪血小板體積而形成的。

參考書目

Tycko DH, Metz MH, Epstein EA, Grinbaum: Flow-cytometric light scattering measurement of red blood cell volume and hemoglobin concentration. *Applied Optics* **24(9)**: 1355-1365 (1985)

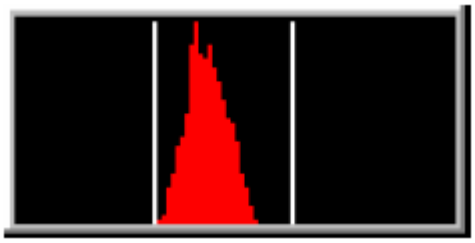
RBC（RBC 率）直方圖



RBC Rate（RBC 率）直方圖顯示細胞計數率的均勻性。

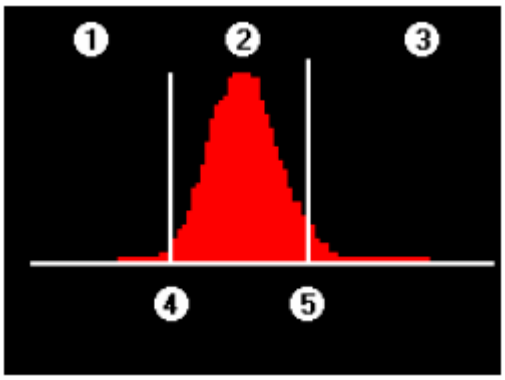
此直方圖數據包含 50 個點，每 200 毫秒獲取一個。每個點代表前 200 毫秒中計數的有效細胞數。

RBC Volume（紅血球體積）直方圖



RBC Volume（紅血球體積）直方圖按細胞體積顯示紅血球的分布。此直方圖的範圍爲 0 fL 至 200 fL。

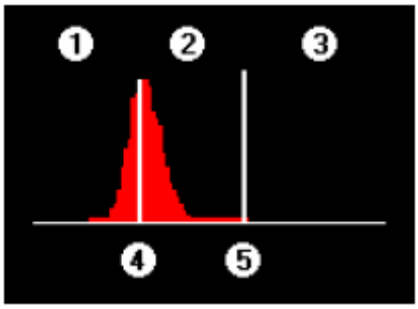
RBC Volume（紅血球體積）直方圖（正常檢體）



1 Microcytic（小紅血球）區
2 Normocytic（正常紅血球）區
3 Macrocytic（大紅血球）區
4 60 fL 標記
5 120 fL 標記

正常檢體的分布呈鐘形曲線形，其最頻值道在 60 fL 至 120 fL 之間。平均紅血球體積(MCV)和紅血球分布寬度(RDW)均由該直方圖確定。MCV 是 RBC Volume（紅血球體積）直方圖的均值。RDW 是種群的差異係數。MCV 校正係數已應用於所顯示數據。

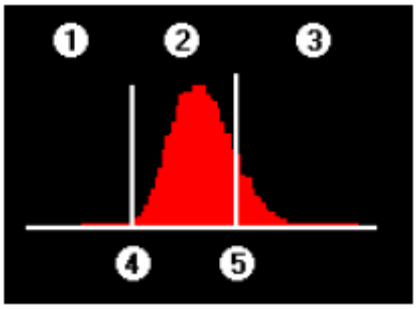
RBC Volume（紅血球體積）直方圖（小紅血球檢體）



1 Microcytic（小紅血球）區
2 Normocytic（正常紅血球）區
3 Macrocytic（大紅血球）區
4 60 fL 標記
5 120 fL 標記

在小紅血球數量增加的檢體中，直方圖曲線左移，表明體積小於 60 fL 的細胞比例的上升。

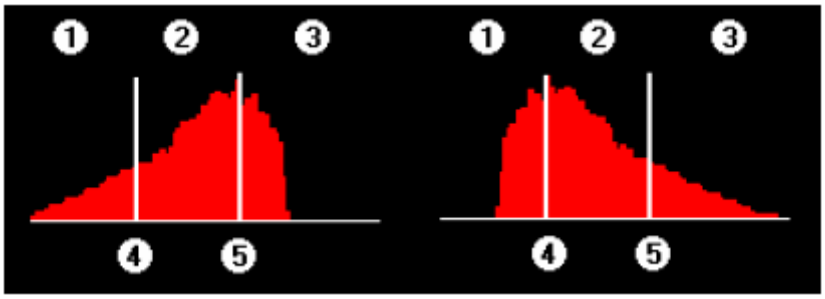
RBC Volume（紅血球體積）直方圖（大紅血球檢體）



1 Microcytic（小紅血球）區
2 Normocytic（正常紅血球）區
3 Macrocytic（大紅血球）區
4 60 fL 標記
5 120 fL 標記

在大紅血球數量增加的檢體中，直方圖曲線右移，表明體積大於 120 fL 的細胞比例的上升。

RBC Volume（紅血球體積）直方圖（紅血球大小不均）

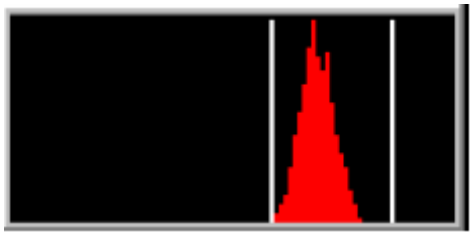


1 Microcytic（小紅血球）區
2 Normocytic（正常紅血球）區
3 Macrocytic（大紅血球）區
4 60 fL 標記
5 120 fL 標記

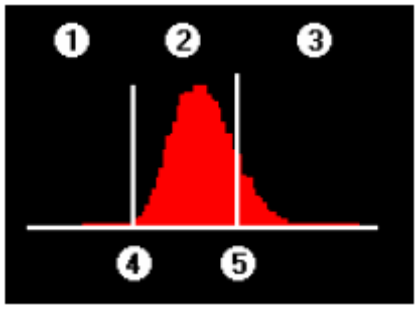
RDW 作爲紅血球大小不均的指標被監控，如果 RDW 超過 16%，結果就會被標記。注意，有同一 RDW 值的兩個檢體大紅血球和小紅血球的等級可能是不同的。

RBC HC 直方圖

RBC 血紅素濃度(RBC HC)直方圖按細胞血紅素濃度顯示紅血球的分布。該直方圖的範圍是 0 g/dL 至 50 g/dL。



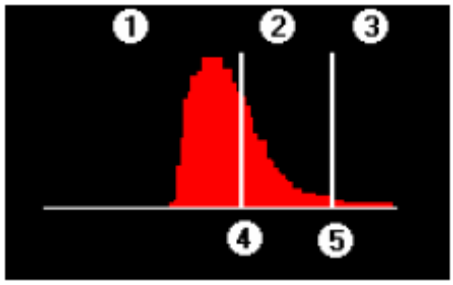
RBC HC 直方圖（正常檢體）



1 Hypochromic（低色素）區
2 Normochromic（正常色素）區
3 Hyperchromic（高色素）區
4 28 g/dL 標記
5 41 g/dL 標記

正常檢體的血紅素濃度分布呈鐘形曲線形，其均值通道在 28 g/dL 至 41 g/dL 之間。細胞血紅素濃度均值(CHCM)和血紅素分布寬度(HDW)來自該直方圖。CHCM 是 RBC HC 直方圖的均值。HDW 是 RBC HC 直方圖的標準差。CHCM 校正係數已應用於所顯示數據。

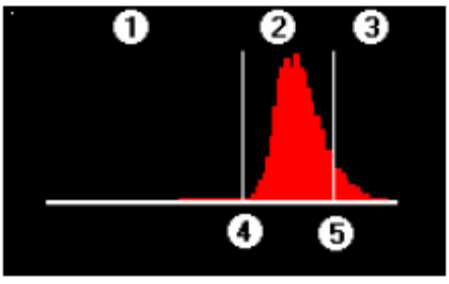
RBC HC 直方圖（低色素檢體）



1 Hypochromic（低色素）區
2 Normochromic（正常色素）區
3 Hyperchromic（高色素）區
4 28 g/dL 標記
5 41 g/dL 標記

在低色素紅血球數量增加的檢體中，直方圖曲線左移，表明血紅素濃度低於 28 g/dL 的細胞比例的上升。

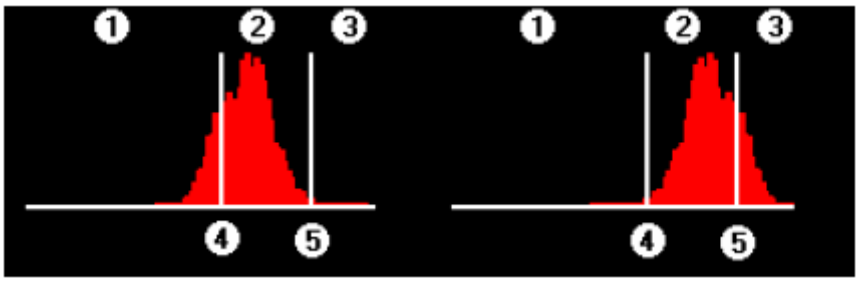
RBC HC 直方圖（高色素檢體）



1 Hypochromic（低色素）區
2 Normochromic（正常色素）區
3 Hyperchromic（高色素）區
4 28 g/dL 標記
5 41 g/dL 標記

在高色素紅血球數量增加的檢體中，直方圖曲線右移，表明血紅素濃度高於 41 g/dL 的細胞比例的上升。

RBC HC 直方圖（血紅素濃度方差檢體）



1 Hypochromic（低色素）區

2 Normochromic（正常色素）區

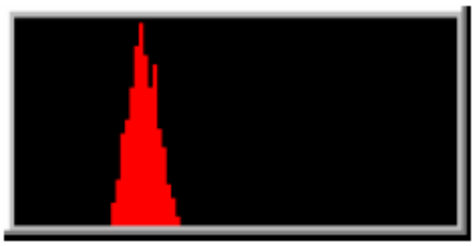
3 Hyperchromic（高色素）區

4 28 g/dL 標記

5 41 g/dL 標記

HDW 指示血紅素濃度方差，如果 HDW 超過 3.4 g/dL，則結果被標記。注意，有同一 HDW 值的兩個檢體低色素和高色素的等級可能是不同的。

RBC CH 直方圖



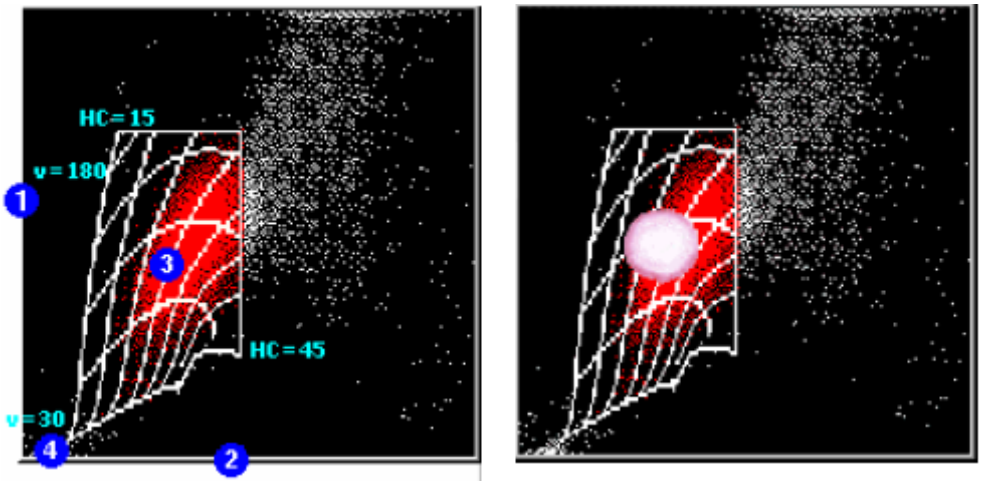
RBC CH（細胞血紅素）直方圖不受細胞體積影響，按每個細胞中存在的血紅素量顯示紅血球分布。

此直方圖的範圍爲 0 皮克至 100 皮克。

Cellular Hemoglobin Content（細胞血紅素含量）是 RBC CH 直方圖的均值。細胞血紅素分布寬度(CHDW)是 RBC CH 直方圖的標準差。

RBC Scatter（紅血球散射）細胞直方圖

RBC Scatter（紅血球散射）細胞直方圖是兩種光散射測量值的圖形表示：高角度光散射（5˚至 15˚）沿 x 軸描繪，而低角度光散射（2˚至 3˚）沿 y 軸描繪。



1 低角度光散射（2˚至 3˚）

2 高角度光散射（5˚至 15˚）

3 包含紅血球的 Mie 圖

4 紅血球方法中檢測的血小板

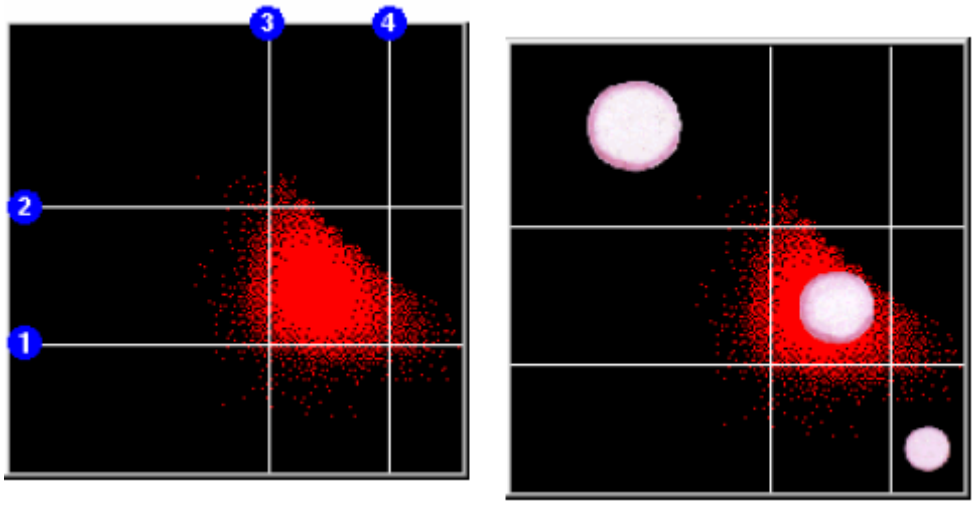
使用均勻球對光散射的 Mie（米氏）理論，每個細胞低角度和高角度光散射信號被轉換爲細胞體積和血紅素濃度值。

RBC 圖顯示光散射測量值與逐個細胞的體積和血紅素濃度特性之間的關係。圖網格環繞內的紅血球體積在 30 fL 至 180 fL 之間，血紅素濃度在 19 g/dL 至 49 g/dL 之間。

對於正常檢體，紅血球群顯示在圖的中央。但由於該圖是非線性的，目測評估紅血球形態會很困難。使用 V/HC 細胞直方圖，它能提供對細胞體積和血紅素濃度的線性表示。

RBC Volume/Hemoglobin（紅血球體積／血紅素，V/HC）細胞直方圖

Volume/Hemoglobin Concentration（體積／血紅素濃度，V/HC）細胞直方圖是 RBC 細胞直方圖中顯示的 RBC 圖的線性版本。在 V/HC 細胞直方圖中，沿 x 軸描繪血紅素濃度，沿 y 軸描繪細胞體積。該細胞直方圖中僅顯示紅血球。



1 60 fL 容量標記

2 120 fL 容量標記

3 28 g/dLHC 標記

5 41 g/dLHC 標記

各標記將細胞直方圖組成紅血球形態的 9 個不同區域。

在 x 軸上，血紅素濃度標記被設置在 28 g/dL(3)和 41 g/dL(4)處。

血紅素濃度低於 28 g/dL 的紅血球著色過淺，而血紅素濃度高於 41 g/dL 的紅血球著色過深。

在 y 軸上，紅血球體積標記被設置在 60 fL(1)和 120 fL(2)處。體積小於 60 fL 的紅血球是小紅血球，而體積大於 120 fL 的是大紅血球。

紅血球矩陣

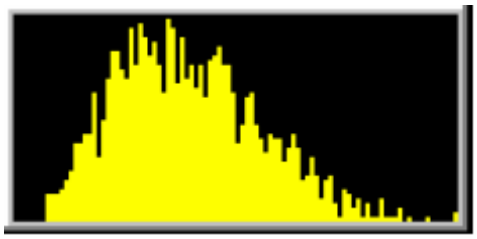
	HC < 28	HC = 28 - 41	HC > 41
V > 120	6 0.0 %	0 0.0 %	0 0.0 %
V = 60 - 120	12116 30.2 %	27558 68.8 %	5 0.0 %
V < 60	94 0.2 %	282 0.7 %	6 0.0 %

RBC Matrix（紅血球矩陣）提供 RBC V/HC 細胞直方圖上對應的 9 個區域的細胞計數和細胞百分比。

注意：分析紅血球體積直方圖和 RBC HC 直方圖可提供對紅血球群的定量分析。此外，可使用 RBC V/HC 細胞直方圖同步分析細胞體積和血紅素濃度而得到關於這些紅血球群的定性訊息。

由於直方圖分析使用未應用於 RBC V/HC 細胞直方圖的校正係數，紅血球矩陣值與基於校正係數值從直方圖獲取的對應%Micro、%Macro、%Hypo 和%Hyper 值之間可能有差異。MCV 和 CHCM 校正係數越接近 1.0，差異就越小。

Platelet X（血小板 X）直方圖



Platelet X（血小板 X）直方圖有 100 道，顯示的高角度（5°至 15°）、高 Gain 光散射測量值，對應於 PLT Scatter（血小板散射）細胞直方圖的 x 軸。

Platelet Y（血小板 Y）直方圖



Platelet Y（血小板 Y）直方圖有 100 道，顯示的低角度（2°至 3°）、高 Gain 的光散射測量值，對應於 PLT Scatter（血小板散射）細胞直方圖的 y 軸。

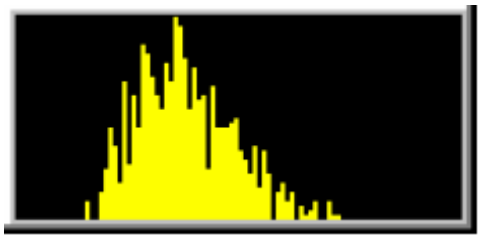
Platelet VOL（血小板體積）直方圖



Platelet VOL（血小板體積）直方圖是按細胞體積顯示細胞分布的二維血小板分析直方圖。體積數據是通過集成分析得到的。

此直方圖的範圍爲 0 fL 至 60 fL。血小板計數中包括體積最高達 60 fL 的大血小板。

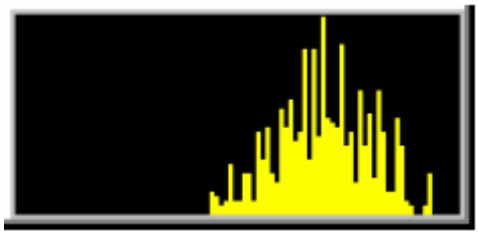
注意：只要紅血球碎片與血小板的比率超過 0.25，系統使用日誌正常擬合算式確定血小板計數，且 Platelet Volume（血小板體積）直方圖中會顯示日誌正常擬合曲線。Platelet PM（血小板 PM）直方圖



Platelet PM（血小板 PM）直方圖是按血小板干質量(PM)顯示血小板分布的二維血小板分析直方圖。

此直方圖的範圍爲 0 pg 至 5.0 pg

Platelet PC（血小板 PC）直方圖

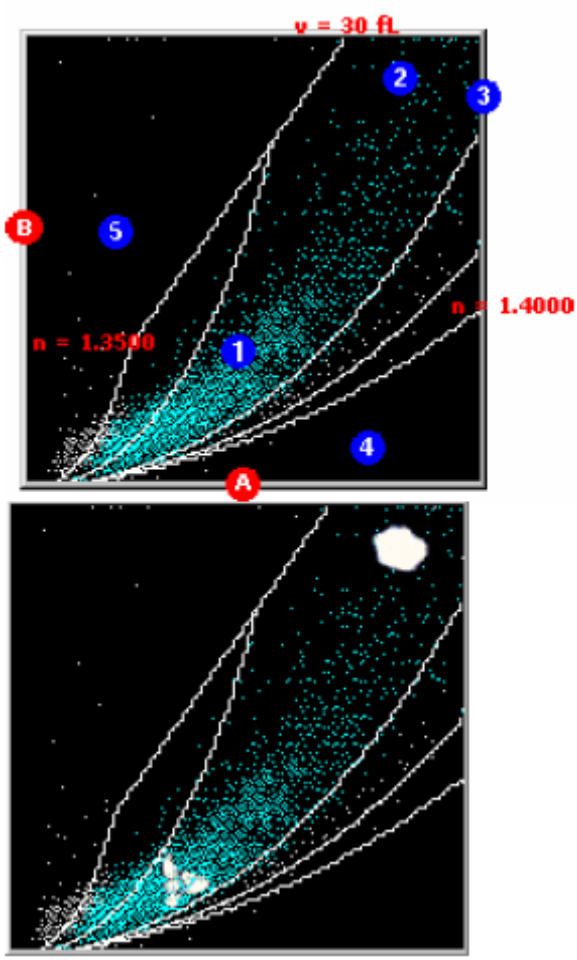


Platelet PC（血小板 PC）直方圖是按折光指數（血小板成分濃度，PC）顯示血小板分布的二維血小板分析直方圖。

此直方圖的範圍爲 0 pg 至 5.0 pg

PLT Scatter（血小板散射）細胞直方圖

PLT Scatter（血小板散射）細胞直方圖是以下光散射測量值的圖形表示：高角度（5˚至 15˚）、高 Gain 光散射描繪在 x 軸(A)，而低角度（2˚至 3˚）、高 Gain 光散射描繪在 y 軸(B)。



1 血小板
2 大血小板
3 紅血球
4 紅血球碎片
5 影紅血球

根據均勻球對光散射的 Mie（米氏）理論，每個細胞低角度和高角度光散射信號被轉換爲細胞體積和折光指數(PC)值。

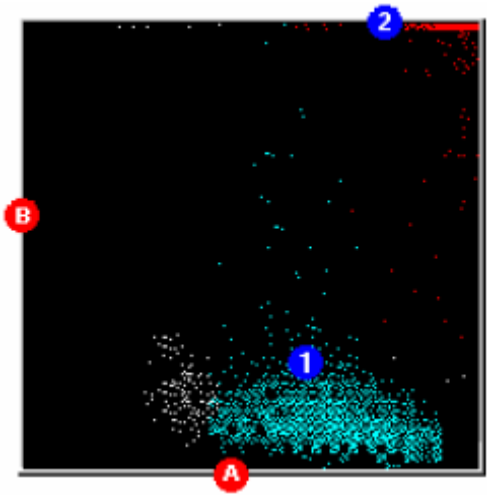
PLT 圖顯示光散射測量值與逐個細胞的體積和折光指數之間的關係。圖網格環繞中的細胞體積在 0 fL 至 30 fL 之間，折光指數在 1.3500 至 1.4000 之間。

血小板計數包括血小板(1)和大血小板(2)。

紅血球碎片(4)和影紅血球(5)不包括在血小板計數內，但會被計數以供標記之用。

由於血小板方法中使用高 Gain，RBC 顯示在位於細胞直方圖右上角的飽和通道中。

PLT Volume/PC（PLT 體積／PC）細胞直方圖



所顯示細胞：

1. 血小板
2. 紅血球

Platelet Volume/Refractive Index (PC)（血小板體積／折光指數(PC)）細胞直方圖顯示 100 X 100 道。

x 軸(A)：折光指數（血小板成分濃度，PC）範圍：0 g/dL 至 40 g/dL

y 軸(B)：血小板體積範圍：0 fL 至 60fL

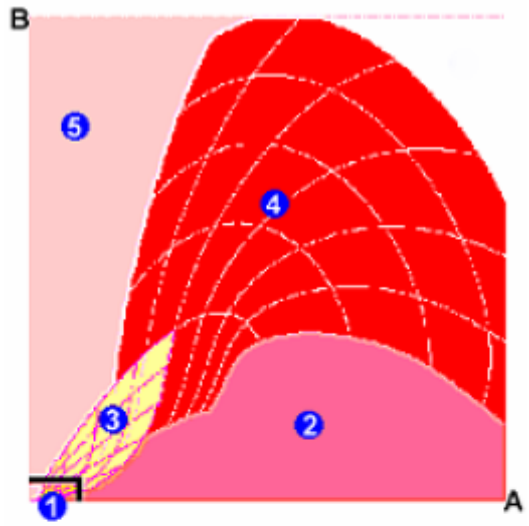
集成分析

2 維血小板分析（2D-PLT 方法）基於對紅析細胞和血小板測量值的集成分析。通過對來自於低角度一高 Gain 和高角度一高 Gain 測量值，並轉換成體積和折光指數值的光散射信號進行配對，形成了 PLT Scatter（血小板散射）細胞直方圖。PLT Scatter（血小板散射）細胞直方圖顯示體積在 0 fL 至 30 fL 之間的細胞。體積大於 30 fL 的細胞的識別和計數是使用 RBC Scatter（紅血球散射）細胞直方圖進行的。

使用集成方法來區分血小板、大血小板、紅血球、紅血球碎片和影紅血球。該示例說明大血小板如何計數：

- 在 PLT Scatter（血小板散射）細胞直方圖上，基於大血小板的折光指數值（1.35 至 1.40）和大於 20 fL 的體積對其進行識別。
- 還可以在 RBC Scatter（紅血球散射）細胞直方圖（下方的區域 3）中，基於其折光指數值（1.35 至 1.40）和小於 60 fL 的體積對大血小板進行識別。

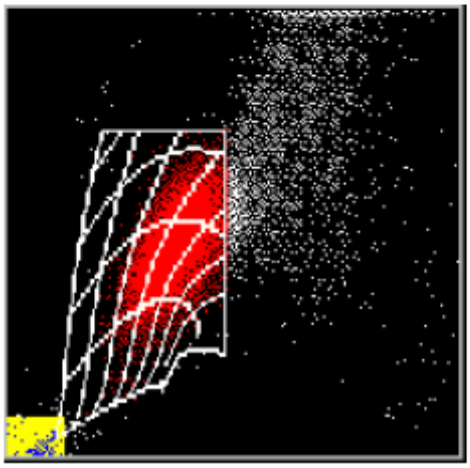
Platelet VOL（血小板體積）直方圖包含血小板和體積最高達 60 fL 的大血小板。



x 軸(A)高角度（5˚至 15˚）光散射

y 軸(B)低角度（2˚至 3˚）光散射

- PLT Scatter Cytogram（血小板散射細胞直方圖）涵益的區域
- 紅血球碎片
- 大血小板
- RBC
- 影紅血球



計算紅血球參數

報告的參數

參數	說明
RBC	紅血球數量 x RBC 校正係數 x 稀釋係數 x 併發率 - 糾正係數
MCV	RBC Volume（紅血球體積）直方圖的均值
RDW	100 x（紅血球體積直方圖的標準差 ÷ MCV）
CHCM	RBC HC 直方圖的均值
HDW	RBC HC 直方圖的標準差
CH	RBC CH 直方圖的均值
HCT	(RBC x MCV) ÷ 10

MCH	(HGB ÷ RBC) x 10
MCHC	(HGB ÷ [RBC x MCV]) x 1000

其他參數

下列參數僅用於研究或實驗室用途，不用於患者報告：

參數	**說明**
CHDW	RBC CH 直方圖的標準差
RBC Flatness	$\sqrt{\frac{\text{差方和}}{9 \times \text{細胞計數率均值}}}$
RBC % Desd Time	100 x（實測死時間 ÷ 實測檢體時間）
RBC Coin Level (RBC 併發率級別）	要調整的併發事件的數量
RBC Coin Count (RBC 併發計數）	RBC Scatter（紅血球散射）細胞直方圖併發計數
RBC R Count	RBC Scatter（紅血球散射）細胞直方圖中紅血球的數量
RBC P Count	RBC Scatter（紅血球散射）細胞直方圖中血小板的數量
RBC Valid Cells （RBC 有效細胞）	從流通池事件獲得的有效信號的數量
#MICRO	RBC Volume（紅血球體積）直方圖中的細胞計數（30 fL 至 60 fL）
%MACRO	$100 \times \frac{\textbf{100 x RBC Volume（紅血球體積）直方圖中的總細胞計數>120 fL}}{\textbf{RBC Volume（紅血球體積）直方圖中的總細胞計數}}$
%MICRO	$100 \times \frac{\textbf{RBC Volume（紅血球體積）直方圖細胞計數＜60 fL}}{\textbf{RBC Volume（紅血球體積）直方圖中的總細胞計數}}$
%HYPER	$100 \times \frac{\textbf{RBC HC 直方圖細胞計數＞41 g/dL}}{\textbf{RBC HC 直方圖中的總細胞計數}}$
%HYPO	$100 \times \frac{\textbf{RBC HC 直方圖細胞計數＜28 g/dL}}{\textbf{RBC HC 直方圖中的總細胞計數}}$
%MICRO/%HYPO RATIO	%MICRO ÷ %HYPO

參數說明

Dilution Factor（稀釋係數）
紅血球通道的稀釋係數是 83.33333E-6。

RBC
紅血球計數

MCV
平均紅血球體積

RDW
紅血球體積分布寬度

CHCM
紅血球血紅素濃度均值

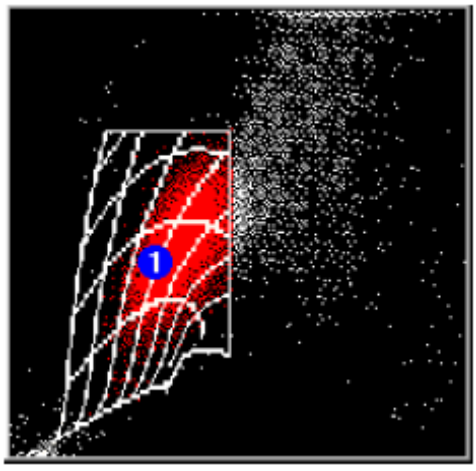
CH
細胞血紅素含量

HDW
血紅素濃度分布寬度

HCT
紅血球壓積

Number of red cells（紅血球數量）
(RBC R Count x RBC Valid Cells) ÷ (RBC R Count + RBC P Count)

RBC R Count

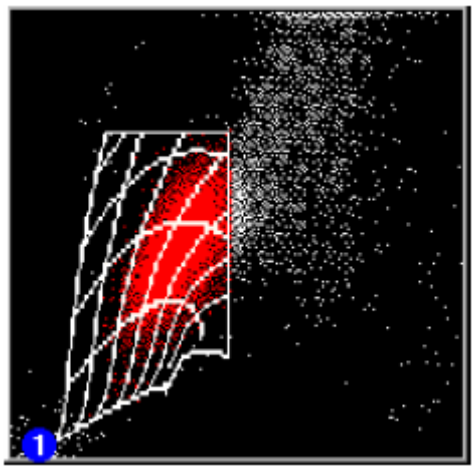


RBC Scatter（紅血球散射）細胞直方圖 RBC 區(1)中細胞的數量。

RBC Valid Cells（RBC 有效細胞）

從流通池事件檢測到的有效電脈衝信號的數量。

RBC P Count



RBC Scatter（紅血球散射）細胞直方圖血小板區(1)中細胞的數量。

CHDW
細胞血紅素分布寬度

RBC % Dead Time
通道忙無法檢測流通池事件時的分析時間的百分比

RBC Coin Level（RBC 併發率級別）
RBC 併發率級別

RBC Coin Count（RBC 併發計數）
RBC 併發計數

RBC R Count
通過紅血球方法得到的原始紅血球計數

RBC P Count
通過紅血球方法得到的原始血小板計數

%MACRO
大紅血球的百分比

%MICRO
小紅血球的百分比

#MICRO
小紅血球的數量

%HYPER
高色素紅血球的百分比

%HYPO
低色素紅血球的百分比

%Micro/%Hypo Ratio
報告該參數以用於區分兩種類型的小紅血球貧血。

參考書目

D'Onofrio G.、Zini G.、Ricerca B. M.、Mancini S.和 Mango G.：自動測量缺鐵性貧血和一地中海貧血的小紅血球和紅血球低色素特性。*Arch.Pathol. Lab. Med.***116:84** (1992)

計算血小板參數

報告的參數

參數	說明
PLT	糾正後血小板計數 x RBC 校正係數 x PLT 校正係數 x 稀釋係數
MPV	Platelet VOL（血小板體積）直方圖的均值

其他參數

下列參數僅用於研究或實驗室用途，不用於患者報告：

參數	說明
Large PLT（大血小板）	體積大於 20 fL 的血小板
MPC	Platelet PC（血小板 PC）直方圖的均值
MPM	Platelet PM（血小板 PM）直方圖的均值
PCDW	Platelet PC（血小板 PC）直方圖的標準差
P Count - 2D	從 2D - 血小板分析得出的血小板和大血小板的原始細胞計數
PCT	(PLT x MPV) ÷ 10000
PDW	100 x（血小板體積直方圖的標準差 ÷ MPV）
PLT N	僅用於血小板的平均折光指數值
PLT X	僅用於血小板的平均高角度、高 Gain 值
PLT Y	僅用於血小板的平均低角度、高 Gain 值
PMDW	Platelet PM（血小板 PM）直方圖的標準差
R Count - 2D	從 2D - 血小板分析得出的紅血球、影紅血球和紅血球碎片的原始細胞計數
RBC - 2D Count	得自 2D - 血小板分析的紅血球一 2D 數量 x 紅血球校正係數 x 稀釋係數 x 併發率 - 糾正係數
紅血球碎片	紅血球碎片計數

參數	說明
影紅血球	影紅血球計數

參數說明

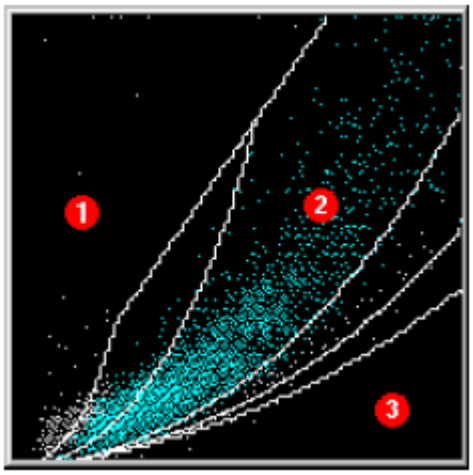
Dilution Factor（稀釋係數）
血小板通道的稀釋係數是 83.33333E-3。

PLT
血小板計數

MPV
平均血小板體積

Large PLT（大血小板）
基於集成分析，從 Platelet Volume（血小板體積）直方圖得出體積大於 20 fL 的血小板的計數。大血小板計數所在單位與在 System Setup（系統設置）選項卡的 Unit Set Configuration（單位設置配置）窗口中爲 PLT 選擇的單位相同。

RBC Fragments（紅血球碎片）
這一計數包含 PLT Scatter（血小板散射）細胞直方圖 RBC Fragments（紅血球碎片）區中，體積低於 30 fL 且折光指數高於 1.400 的事件。



1 影紅血球區

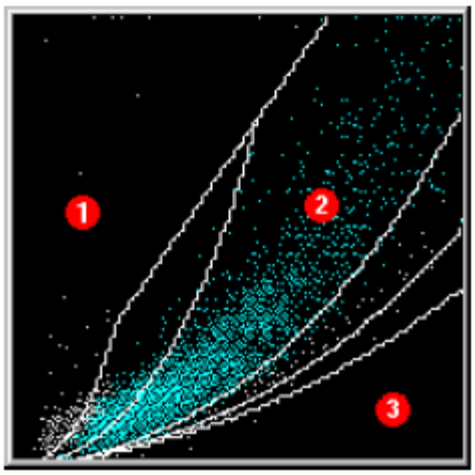
2 血小板區

3 紅血球碎片區

紅血球碎片計數所在單位與在 System Setup（系統設置）選項卡的 Unit Set Configuration（單位設置配置）窗口中爲 RBC 選擇的單位相同。

RBC Ghosts（影紅血球）

此計數包括 PLT Scatter（血小板散射）細胞直方圖 RBC Ghosts（影紅血球）區中折光指數低於 1.350 的事件。



1 影紅血球區

2 血小板區

3 紅血球碎片區

影紅血球計數所在單位與在 System Setup（系統設置）選項卡的 Unit Set Configuration（單位設置配置）窗口中爲 RBC 選擇的單位相同。

MPC

平均血小板成分濃度

MPM

平均血小板干質量

PCDW

血小板成分分布寬度

PDW

血小板體積分布寬度

PMDW

血小板干質量分布寬度

PCT

血小板壓積

RBC Fractional Dead Time（RBC 死時間段）

通道忙於處理流通池事件的時間段。當紅血球／血小板通道忙於識別特定流通池事件時，無法處理可能出現的任何其他事件。通過測量這段”死時間”，分析儀可以對這些錯過的事件做出校正。

注意，紅血球／血小板通道死時間有紅血球和血小板成分。

Corrected Platelet Count（糾正的血小板計數）

糾正的血小板計數是通過 P Count-2D、R Count-2D RBC Fractional Dead Time 和 RBC Valid Cells 計算出來的。

P Count - 2D

被標示爲血小板和大血小板的細胞的數量。血小板獲取自 PLT Scatter（血小板散射）細胞直方圖，而大血小板獲取自集成分析。

R Count - 2D

紅血球、影紅血球以及紅血球碎片的計數獲取自集成分析。

Number of red cell - 2D

(R Count - 2D x RBC Valid Cells) ÷ (R Count - 2D + P Count - 2D)

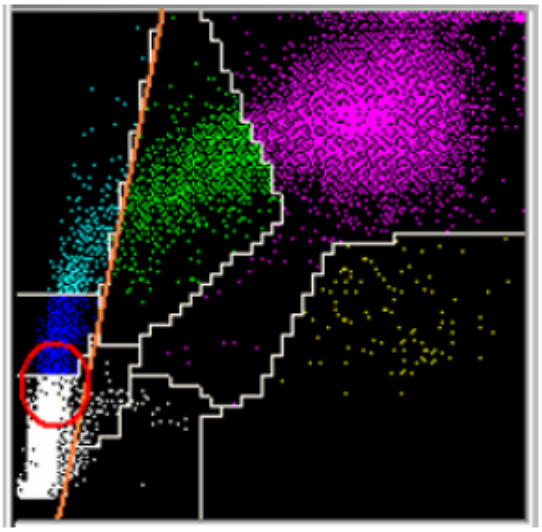
NRBC 分析

NRBC 方法描述

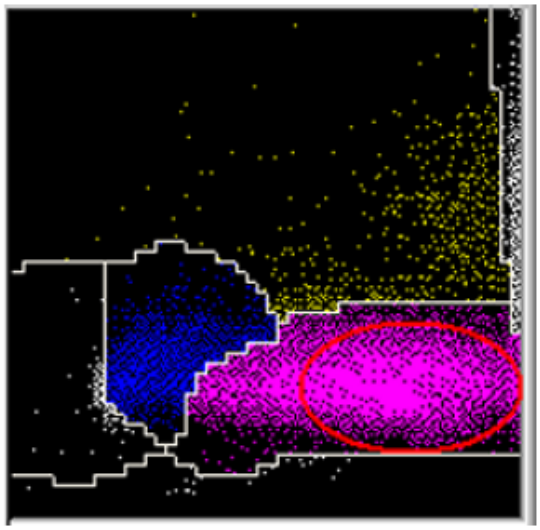
對於每μL nRBC 大於等於 200，或者至少 2%有 WBC 計數的 nRBC 最低爲 3000/μL 的全血檢體，ADVIA 2120/2120i NRBC 分析方法報告 NRBC 計數。

此方法既報告絕對 nRBC 計數(10^9 /L)也報告百分比計數(#NRBC/100 WBC)。它運糾正 nRBC 的 WBC 計數，重新計算 WBC 分類和%MN 與%PMN。也提供了未糾正計數，並用小寫字母“u”標明。

注意：NRBC 結果只可用於在 CBC/Diff 或 CBC/Diff/Retic 模式下處理的檢體。



說明 nRBC 和不染色線位置的 PEROX 細胞直方圖



說明 nRBC 位置的 BASO 細胞直方圖

此方法通過過氧化物酶通道中細胞核的大小，以及嗜鹼性粒細胞／分葉核中細胞核密度識別 nRBC。

在 Peroxidase Channel（過氧化物酶通道）細胞直方圖的不染色區，nRBC 細胞核位於噪音與淋巴細胞之間。噪音與淋巴細胞通常形成不同的種群，會對這些種群進行分析以得出計數。

在 Basophil/Lobularity channel（嗜鹼性粒細胞／分葉核通道）細胞直方圖中，nRBC 細胞核位於多形核細胞區而非單個核區，這是由於它們比淋巴細胞細胞核或單核細胞細胞核更致密。由於它們不是多形核細胞的細胞核，此區域中細胞核數量與 Peroxidase Channel（過氧化物酶通道）中嗜中性粒細胞與嗜酸性粒細胞之和之間的差可能等於 **NRBC** 計數。該差稱爲**"Barox" (Bsaso/Perox)**計數。

該方法爲每個檢體生成 4 個 NRBC 計數。

Histo count（Histo 計數）
通過分析 Peroxidase Channel Y-axis（過氧化物酶通道 Y 軸）直方圖不染色區得出的 NRBC 計數

Gaussian count（高斯計數）
通過對 Peroxidase Channel Y-axis（過氧化物酶通道 Y 軸）直方圖不染色區的 nRBC 部分進行高斯擬合得出的 NRBC 計數

Residual count（殘留物計數）
從 Peroxidase Channel Y-axis（過氧化物酶通道 Y 軸）直方圖減去噪音和淋巴細胞得出的 NRBC 計數

Barox count（Barox 計數）
從#nRBC = #PMNs - #NEUTs - #EOS 方程式得出的 NRBC 計數

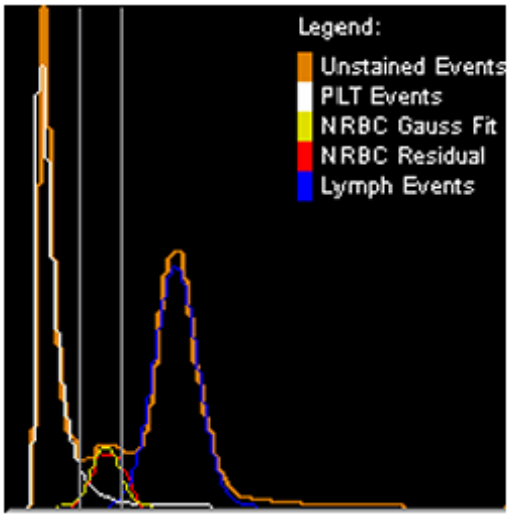
然後，如果存在 NRBC 計數，系統會使用選擇規則確定其中哪些要報告。

NRBC Enumeration（NRBC 計數）直方圖

NRBC Enumeration（NRBC 計數）有 100 道，顯示光散射測量值，對應於 Peroxidase Channel Y-axis（過氧化物酶通道 Y 軸）直方圖。此處對 NRBC 分析的顯示表明以下各項的疊加：

- 不染色事件
- 血小板事件
- NRBC 高斯擬合
- NRBC 殘留物
- 淋巴細胞事件

此直方圖運包括標明 Histo 計數和 Residual（殘留物）計數的門柱。只有當 Histo 計數和 Residual（殘留物）計數是選定 NRBC 計數時這些門柱才會出現。



NRBC Enumeration（NRBC 計數）直方圖

計算已報告 NRBC 參數

當檢測到 nRBC 時，系統對已報告 WBC 計數進行糾正。

Histo 計數、Residual（殘留物）計數或 Gaussian（高斯）計數

$$\frac{WBCu}{1+\frac{\%NRBC}{100}}$$

Barox 計數

$$\left(WBCP+\frac{\%Neut+\%Eos}{100}\right)+\left(WBCB+\frac{\%MN+\%Baso}{100}\right)$$

網狀紅血球方法

細胞化學反應

網狀紅血球細胞化學反應包含兩個步驟：

步驟 1　用 ADVIA 2120/2120i autoRETIC 試劑以將紅血球和血小板等體積球形化。

步驟 2　基於網狀紅血球的 RNA 含量將其分類染色。

ADVIA 2120/2120i autoRETIC

注意：有關 ADVIA 2120/2120i autoRETIC 試劑內容物的更詳細訊息，請參見第 8 章。

ADVIA 2120/2120i aut0RETIC 試劑包含兩性離子洗滌劑（表面活性劑），能將紅血球等體積球形化。它還包含陽離子染劑 Oxazine 750，根據細胞的 RNA 含量將其染色。

測量

來自網狀紅血球反應池的定容細胞懸液通過流通池時，會測量每個細胞的低角度光散射（2°至 3°）信號、高角度光散射（5°至 15°）信號以及吸收信號。ADVIA 2120/2120i 鞘液／沖洗液流經流通池時會將檢體流包裹起來。

低角度光散射信號和高角度光散射信號與細胞大小和血紅素濃度成正比。光吸收與 RNA 含量成正比。染色後網狀紅血球將比成熟紅血球吸收更多的光。

兩種光散射信號被檢測、電子化放大，並被分成 6 個信號。

低角度光散射信號之一被放大 28 倍。

高角度光散射信號之一被放大 12 倍。

吸收信號之一被放大 33 倍。

處理之後，會出現下面的訊息：

Retic Rate（Retic 率）直方圖顯示網狀紅血球通道中的細胞到達率。

RETIC Abs Flatness（網狀紅血球吸收均勻度）直方圖按 200 毫秒間隔顯示吸收均值。

RETIC Abs（網狀紅血球吸收）直方圖按成熟紅血球和網狀紅血球的吸收值顯示其疊加分布。

RETIC Volume（網狀紅血球體積）直方圖不受血紅素濃度影響，按成熟紅血球和網狀紅血球的細胞體積顯示其疊加分布。

RETIC HC 直方圖不受細胞體積影響，按成熟紅血球和網狀紅血球的血紅素濃度顯示其疊加分布。

RETIC CH 直方圖按成熟紅血球和網狀紅血球的血紅素含量（細胞血紅素）顯示其疊加分布。

RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖由成對的高角度、低 Gain 光散射和高 Gain 吸收數據組成。檢體特定閾值將細胞種分隔開來。

RETIC Scatter（網狀紅血球散射）細胞直方圖通過沿 x 軸描繪高角度、低 Gain 光散射，沿 y 軸描繪低角度、低 Gain 光散射而形成。RETIC V/HC 細胞直方圖表示細胞體積和血紅素濃度。

網狀紅血球方法命名

成熟(m)，網狀紅血球(r)，選通(g)

小寫字母 m、r 和 g 常用於網狀紅血球參數中用來標示特定種群。

例如：MCVm、MCVr 和 MCVg 分別指示成熟紅血球、網狀紅血球及選通種群的平均細胞體積。

”混合通道”指同時包含成熟紅血球和網狀紅血球的紅血球總種群

陽性細胞群對陽性細胞群

由於網狀紅血球含有 RNA 且被 ADVIA 2120/2120i autoRETIC 試劑染色，它們是陽性細胞群。成熟紅血球不染色，是陽性細胞群。

未成熟網狀紅血球指數

Immature Reticulocyte Fraction（未成熟網狀紅血球指數，IRF），是 NCCLS H44-A 文件”網狀紅血球計數方法：流式細胞術與活體染色染料；核准指南”中建議的描述性術語，用來代替以前使用的術語 Reticulocyte Maturation Index（網狀紅血球成熟指數，RMI）。

計算兩個 IRF 參數：IRF-H 和 IRF-H+M.

RETIC Rate Histogram（RETIC 率直方圖）



RETIC Rate（RETIC 率）直方圖顯示細胞計數率的均勻性。

率直方圖數據包含 50 個點，每 200 毫秒獲取一個。每個點代表前 200 秒中計數的有效細胞數。

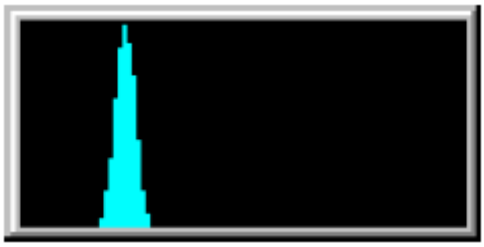
RETIC Abs Flatness（網狀紅血球吸收均勻度）直方圖



RETIC Abs Flatness（網狀紅血球吸收均勻度）直方圖數據包含 50 個點，每 200 毫秒獲取一個。每個點代表前 200 毫秒的平均吸收。

該直方圖提供吸收信號”均勻度”的可見指示，以監控激光性能。激光振盪能導致表現不穩定。

RETIC Abs（網狀紅血球吸收）直方圖

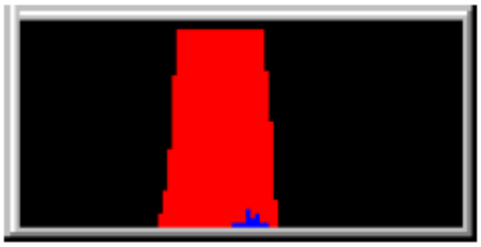


RETIC Abs（網狀紅血球吸收）直方圖根據成熟紅血球和網狀紅血球的糾正後吸收值表現其分布。

吸收糾正對吸收通道光學器件中的偏差和未糾正的散射光進行校正。

RETIC Volume（網狀紅血球體積）直方圖

RETIC Volume（網狀紅血球體積）直方圖僅按細胞大小表現成熟紅血球和網狀紅血球的疊加分布。此直方圖的範圍爲 0 fL 至 200 fL。所顯示數據包括 MCVg 校正係數。



成熟紅血球群（紅色）

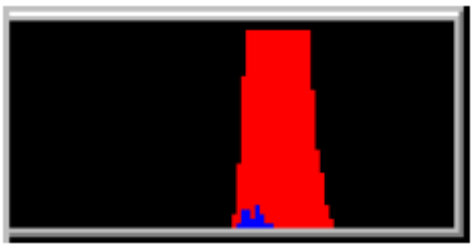
網狀紅血球群（藍色）

RETIC Volume（網狀紅血球體積）直方圖參數

%MACROr	細胞體積大於 120 fL 的網狀紅血球群的百分比
%MACROm	細胞體積大於 120 fL 的成熟紅血球群的百分比
%MACROg	細胞體積大於 120 fL 的選通細胞群的百分比
%MICROr	細胞體積小於 60 fL 的網狀紅血球群的百分比
%MICROm	細胞體積小於 60 fL 的成熟紅血球群的百分比
%MICROg	細胞體積小於 60 fL 的選通細胞群的百分比
MCVr	Mean Corpuscular Volume（平均紅血球體積）是網狀紅血球群的 RETIC Volume（網狀紅血球體積）直方圖的均值。
MCVm	Mean Corpuscular Volume（平均紅血球體積）是成熟紅血球群的 RETIC Volume（網狀紅血球體積）直方圖的均值。
MVCg	Mean Corpuscular Volume（平均紅血球體積）是選通細胞群的 RETIC Volume（網狀紅血球體積）直方圖的均值。
MCV Delta	MCVF - MCVm
RDWr	Red cell Distribution Width（紅血球分布寬度）是網狀紅血球群的 RETIC Volume（網狀紅血球體積）直方圖（15 道至 99 道）的差異係數(CV)。
RDWm	Red cell Distribution Width（紅血球分布寬度）是成熟紅血球群的 RETIC Volume（網狀紅血球體積）直方圖（15 道至 99 道）的差異係數(CV)。
Rowg	Red cell Distribution width（紅血球分布寬度）是選通細胞群的 RETIC Volume（網狀紅血球體積）直方圖（15 道至 99 道）的差異係數(CV)。
RDW Delta	RDWr - RDWm

RETIC HC 直方圖

RETIC hemoglobin concentration（網狀紅血球血紅素濃度，RETIC HC）直方圖僅按細胞血紅素濃度表現成熟紅血球和網狀紅血球的疊加分布。該直方圖的範圍是 0 g/dL 至 50 g/dL。所顯示數據包括 CHCMg 校正係數。



成熟紅血球群（紅色）

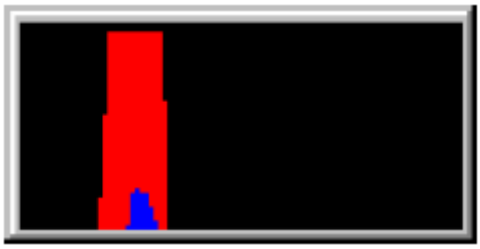
網狀紅血球群（藍色）

RETIC HC 直方圖參數

%HYPERr	細胞血紅素濃度高於 41 g/dL 的網狀紅血球群的百分比
%HYPERm	細胞血紅素濃度高於 41 g/dL 的成熟紅血球群的百分比
%HYPERg	細胞血紅素濃度高於 41 g/dL 的選通細胞群的百分比
%HYPOr	細胞血紅素濃度低於 28 g/dL 的網狀紅血球群的百分比
%HYPOm	細胞血紅素濃度低於 28 g/dL 的成熟紅血球群的百分比
%HYPOg	細胞血紅素濃度低於 28 g/dL 的選通細胞群的百分比
CHCMr	Cellular Hemoglobin Concentration Mean（細胞血紅素濃度均值）是網狀紅血球群的 RETIC HC 直方圖的均值。
CHCMm	Cellular Hemoglobin Concentration Mean（細胞血紅素濃度均值）是成熟紅血球群的 RETIC HC 直方圖的均值。
CHCMg	Cellular Hemoglobin Concentration Mean（細胞血紅素濃度均值）是選通細胞群的 RETIC HC 直方圖的均值。
CHCM Delta	CHCMr - CHCMm
HDWr	Hemoglobin Distribution Width（血紅素分布寬度）是網狀紅血球群的 RETIC HC 直方圖的標準差(SD)。
HDWm	Hemoglobin oistribution Width（血紅素分布寬度）是成熟紅血球群的 RETIC HC 直方圖的標準差(SD)。
HDWg	Hemoglobin Distribution Width（血紅素分布寬度）是選通方法細胞群的 RETIC HC 直方圖的標準差(SD)。
HDW Delta	HDWr - HDWm

RETIC CH 直方圖

RETIC cellular hemoglobin（網狀紅血球細胞血紅素，RETIC CH）直方圖按每個細胞所含血紅素的實際重量或干質量表現成熟紅血球和網狀紅血球的疊加分布。此直方圖的範圍爲 0 Pg 至 100 pg。



成熟紅血球群（紅色）

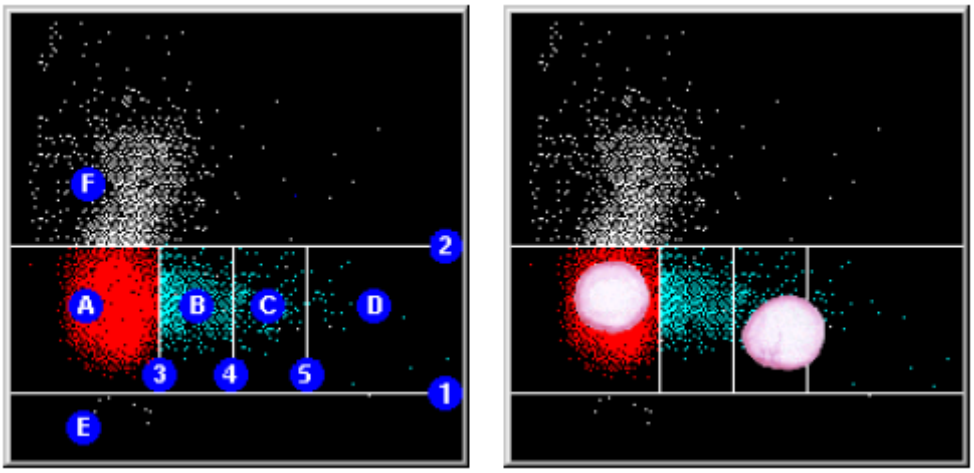
網狀紅血球群（藍色）

RETIC CH 直方圖參數

%HIGH CHr	細胞血紅素濃度高於 31 pg 的網狀紅血球群的百分比
%HIGH CHm	細胞血紅素濃度高於 31 pg 的成熟紅血球群的百分比
%HIGH CHg	細胞血紅素濃度高於 31 pg 的選通細胞群的百分比
%LOW CHr	細胞血紅素濃度低於 27 pg 的網狀紅血球群的百分比
%LOW CHm	細胞血紅素濃度低於 27 pg 的成熟紅血球群的百分比
%LOW CHg	細胞血紅素濃度低於 27 pg 的選通細胞群的百分比
CHr	Cellular Hemoglobin Mean（細胞血紅素均值）是網狀紅血球群的 RETIC CH 直方圖的均值。
CHm	Cellular Hemoglobin Mean（細胞血紅素均值）是成熟紅血球群的 RETIC CH 直方圖的均值。
CHg	Cellular Hemoglobin Mean（細胞血紅素均值）是選通細胞群的 RETIC CH 直方圖的均值。
CH Delta	CHr - CHm
CHDWr	Cellular Hemoglobin Distribution Width（細胞血紅素分布寬度）是網狀紅血球群的 RETIC CH 直方圖的標準差(SD)。
CHDWm	Cellular Hemoglobin Distribution Width（細胞血紅素分布寬度）是成熟紅血球群的 RETIC CH 直方圖的標準差(SD)。
CHDWg	Cellular Hemoglobin Distribution Width（細胞血紅素分布寬度）是選通細胞群的 RETIC CH 直方圖的標準差(SD)。
CHDW Delta	CHDWr - CHDWm

RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖

RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖是吸收和光散射測量值的圖形表示：高 Gain、吸收（細胞成熟）描繪在 x 軸，而高角度、低 Gain 光散射（細胞大小）描繪在 y 軸。



1 RTCPlatelet（RTC 血小板）閾值

2 RTCCoincidence（RTC 併發）閾值

3 RTC 閾值

4 低／中 RTC 閾值

5 中／高 RTC 閾值

A 成熟紅血球

B 低吸收網狀紅血球

C 中等吸收網狀紅血球

D 高吸收網狀紅血球

E 血小板

F 併發事件

y 軸上的兩個閾值(1)(2)設置如下：

1. 分析儀掃描查找 y 軸上 10 道和 99 道之間的散射最頻值。
2. 計算均值道和標準差(SD)。
3. RTC Platelet（RTC 血小板）閾值(1)被設置爲均值道減 3.5 SD，將血小板與成熟紅血球和網狀紅血球分割開來。
4. RTC Coincidence（RTC 併發）閾值(2)被設置爲均值道加 3.5 SD，將併發細胞與成熟紅血球和網狀紅血球分隔開。

x 軸上的 RTC 閾值(3)設置如下：

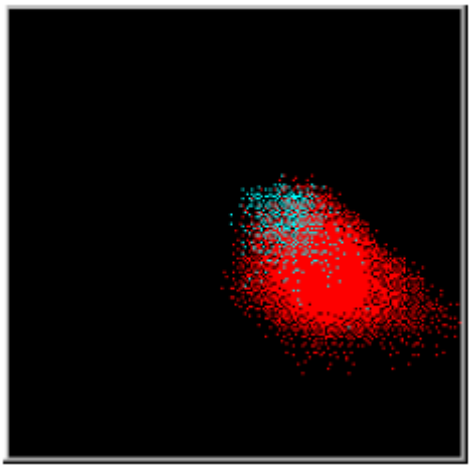
1. 分析儀掃描查找 x 軸上 2 道和 25 道之間的吸收模型
2. 計算最頻值任一側的 6 個道的標準差(SD)。

3. RTC 閾值設置爲最頻值道的 3.2 SD，將成熟紅血球與網狀紅血球分隔開。

另外兩個閾值(4)(5)設置在 x 軸上，通過網狀紅血球群的不同成熟階段將其分隔開。最年輕的網狀紅血球 RNA 量（吸收）越高，顯示在 x 軸的遠端。

1. 用 75 減去 RTC 閾值道，得出的差值再除以 3。
2. 低／中 RTC 閾值(4)設定爲 RTC 閾值道加上步驟 1 中計算出的值。
3. 中／高 RTC 閾值(5)設定爲低／中 RTC 閾值道加上步驟 1 中計算出的值。

RETIC V/HC 細胞直方圖

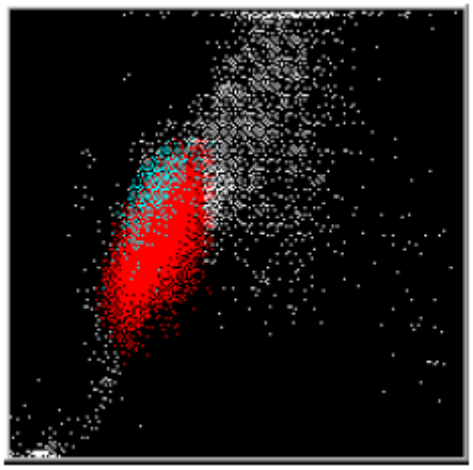


在 V/HC 細胞直方圖中，沿 x 軸描繪血紅素濃度，沿 y 軸描繪細胞體積。

被標示爲成熟紅血球的細胞是紅色的，而被標示爲網狀紅血球的白細胞是藍綠色的。

RETIC Scatter（網狀紅血球散射）細胞直方圖

RETIC Scatter（網狀紅血球板散射）細胞直方圖是兩種光散射測量值的圖形表示：高角度、低 Gain 光散射沿 x 軸描繪，而低角度、低 Gain 光散射沿 y 軸描繪。被標示爲成熟紅血球的細胞染成紅色，而被標示爲網狀紅血球的白細胞染成藍綠色。



根據均勻球散射 Mie（米氏）理論，每個細胞的低角度和高角度光散射信號被轉換爲細胞體積和血紅素濃度值。紅血球的細胞體積在 30 fL 至 180 fL 之間，且血紅素濃度在 19 g/dL 至 49 g/dL 之間。

參考書目

Tycko DH, Metz MH, Epstein EA, Grinbaum: Flow-cytometric light scattering measurement of red blood cell volume and hemoglobin concentration. *Applied Optics* **24(9)**: 1355-1365 (1985)

計算網狀紅血球參數

已報告參數

參數	說明
#Retic	RBC x (%Retic ÷ 100) x 1000
%Retic	100 x (RETIC Count ÷ #RTC Gated Cells) x % RETIC Cal Factor
CHr	網狀紅血球群的 RETIC CH 直方圖均值

系統參數

下列參數僅用於研究或實驗室用途，不作爲患者結果：

參數	說明
RTC RBC	RBC Count（RBC 計數）
RTC Flatness（RTC 均勻度）	$\sqrt{\frac{\text{差方和}}{9\times \text{細胞計數率均值}}}$
RTC % Desd Time	100 x（實測死時間 ÷ 實測檢體時間）
RTC % Noise	100 x (Outlier Cells ÷ #RTC Cells Analyzed)
Mean Absorption（吸收均值）	網狀紅血球群的 RETIC Abs（平均網狀紅血球吸收）直方圖均值
ABS Low Cell Count（低吸收細胞計數）	RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖 x 軸 1 道至 3 道中的計數
ABS Mode（吸收最頻值）	吸收種群的最頻值道
RTC Valid Cells	從流通池事件獲得的有效信號的數量方法

其他參數

下列參數僅用於研究或實驗室用途，不作爲患者結果：

參數	說明
CHCMr	網狀紅血球群的 RETIC HC 直方圖均值
MCVm	成熟種群的 RETIC Volume（網狀紅血球體積）直方圖均值
MCVr	網狀紅血球群的 RETIC Volume（網狀紅血球體積）直方圖均值
#Neg RBC	成熟紅血球數量
%Neg RBC	100 x (#Neg RBC ÷ #RTC Gated Cells)
Retic	Count（網狀紅血球數）網狀紅血球事件數量
#LRetic	低吸收網狀紅血球數量
%LRetic	100 x (#LRetic ÷ RETIC Count)
#MRetic	中等吸收網狀紅血球數量
%MRetic	100 x (#MRetic ÷ RETIC Count)
#HRetic	高吸收網狀紅血球數量
%HRetic	100 x (#HRetic ÷ RETIC Count)
IRF-H	100 x (#HRetic ÷ RETIC Count)
IRF-M+H	100 x ([#HRetic + #MRetic] ÷ RETIC Count)
RTC Mean X	RETIC Scatter（網狀紅血球散射）細胞直方圖 x 道均值
RTC Mean Y	RETIC Scatter（網狀紅血球散射）細胞直方圖 y 道均值
#RTC Cells Acquired	所獲有效信號數
#RTC Cells	RETIC Scatter（網狀紅血球散射）細胞直方圖 Analyzed 上體積與血紅素值非零，而且不在 99 道中的細胞
#RTC Gated Cells	#Neg RBC＋閾值限制內的網狀紅血球計數
Slope Negative Cells（陽性細胞斜率）	與 RETIC Scatter（網狀紅血球散射）細胞直方圖 y 軸相關的陽性（成熟紅血球）種群的斜率

參數說明

#RET - C
網狀紅血球的絕對數量

%RETIC
網狀紅血球的百分比

CHCMr
網狀紅血球血紅素濃度均值

CHr
網狀紅血球血紅素含量

MCVm
成熟種群的平均細胞體積

MCVr
網狀紅血球群的平均細胞體積

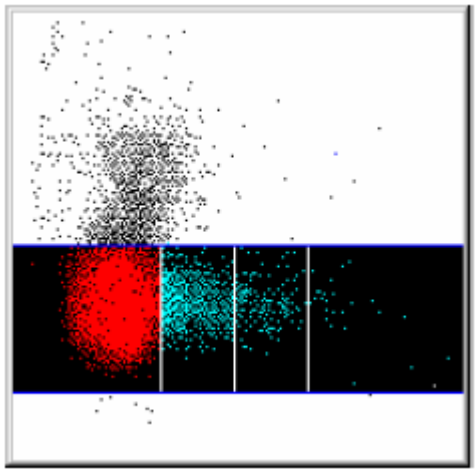
RBC
系統始終使用得自紅血球／血小板方法的紅血球計數，即便在僅有網狀紅血球選擇的情況下運行檢體時也是如此。

RTC RBC
得自網狀紅血球方法的紅血球計數。按用紅血球／血小板方法得出紅血球計數相同的方法計算 RTC RBC 計數。

RTC % Dead Time
通道忙無法檢測流通池事件時的分析時間的百分比

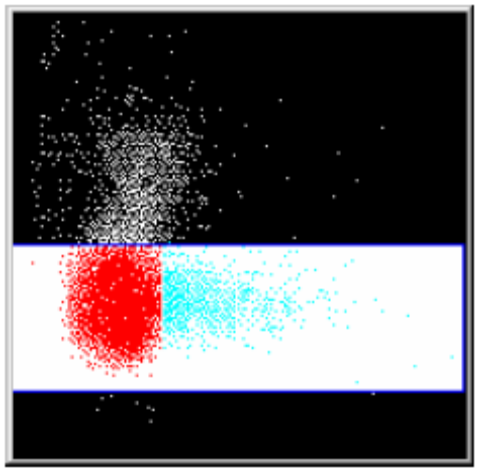
RTC % Noise
來自離層區的事件的百分比

離層細胞



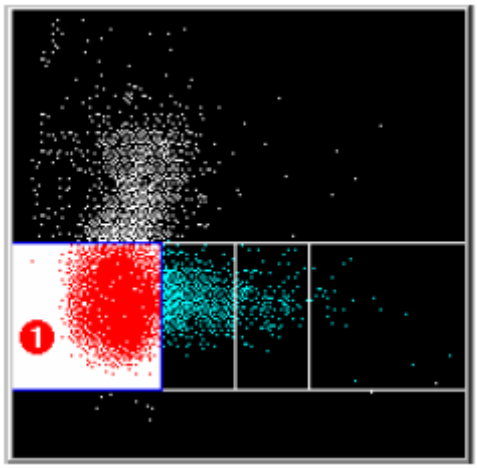
離層細胞計數包括高散射值低於 RTC（RTC 血小板）閾值的細胞，以及高散射值高於 RTC Coincidence（RTC 併發）閾值的細胞。

RTC 選通細胞



RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖中除 99 道外，RTC（RTC 血小板）閾值與 RTC Coincidence（RTC 併發）閾值之間的細胞的數量。

Neg RBC



RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖的成熟紅血球區(1)中細胞的數量。

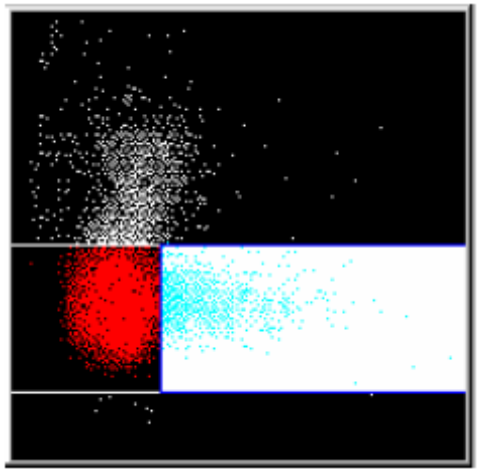
#Neg RBC

成熟紅血球的計數

% Neg RBC

成熟紅血球的百分比

選通種群中網狀紅血球的數量

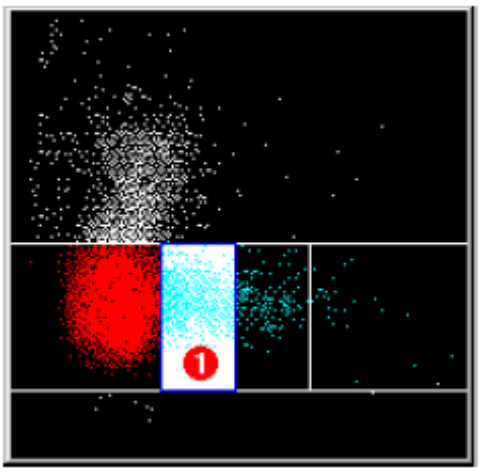


RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖的 3 個網狀紅血球區中細胞的總數。

Retic Count（網狀紅血球計數）

選通種群中網狀紅血球的計數

低吸收網狀紅血球數量



RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖的 RTC 閾值與低／中 RTC 閾值之間的選通細胞的數量(1)。

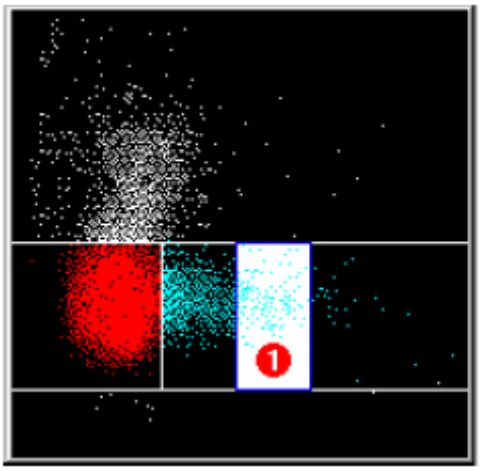
#LRetic

低吸收網狀紅血球的計數

%LRetic

低吸收網狀紅血球的百分比

中等吸收網狀紅血球的數量



RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖的低／中 RTC 閾值與中／高 RTC 閾值之間的選通細胞的數量(1)。

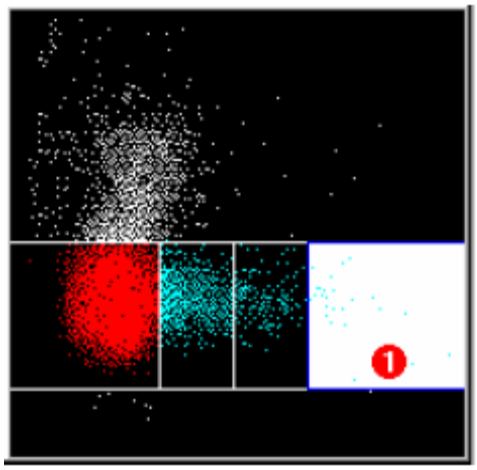
#MRetic

中等吸收網狀紅血球的計數

%MRetic

中等吸收網狀紅血球的百分比方法

高吸收網狀紅血球數量



RETIC Scatter Abs（網狀紅血球散射吸收）細胞直方圖的中／高 RTC 閾值右側的選通細胞的數量 (1)。

#HRetic

高吸收網狀紅血球的計數

%HRetic

高吸收網狀紅血球的百分比

管制訊息

方法說明 4

概述 4
內容說明 4
檢體收集和製備 4
校正品和品管品 5
輔助試劑 7
運行 8
結果計算 8
結果的解釋 8
廢液處理規定 9
廢液分析 9
系統方法訊息 12
系統方法訊息：期望用途 13
系統方法訊息：過程準則 13
系統方法訊息：試劑 13
系統方法訊息：存儲與穩定性 13
系統方法訊息：檢體處理 13
系統方法訊息：未提供所需材料 13
系統方法訊息：過程 14
系統方法訊息：品質管制 14
系統方法訊息：增益調整 14
系統方法訊息：校正 15
系統方法訊息：結果 15
系統方法訊息：過程限制 15
系統方法訊息：期望值 15
系統方法訊息：性能特徵 15

CLSI M29-A3 號文件和 SIEMENS 方法主題交叉參考 16

CBC 方法 19

期望用途 19
過程準則 20
試劑 21
存儲與穩定性 24
增益調整 24
校正 24
檢體處理 25
未提供所需材料 26
過程 26
品質管制 26
結果 26
過程限制 26
期望值 27
性能特徵：不精確性 28
性能特徵：相關數據 28
性能特徵：殘留檢體 29

性能特徵分析範圍 29
CSF 方法 30
期望用途 30
過程準則 30
試劑 31
存儲與穩定性 32
增益調整 32
校正 32
檢體處理 32
未提供所需材料 33
測試 CSF 檢體的過程 33
品質管制 35
結果 36
過程限制 36
干擾物質 37
期望值 37
性能特徵精度 37
性能特徵準確性 38
CSF RBC 計數 39
性能特徵殘留檢體 40
性能特徵分析範圍 40
WBC DIFF 方法 41
期望用途 41
過程準則 41
試劑 43
存儲與穩定性 45
校正品和品管品 45
增益調整 45
校正 45
檢體處理 46
未提供所需材料 46
過程 46
品質管制 47
結果 47
過程限制 47
期望值 48
性能特徵不精確性 48
性能特徵相關數據 49
網狀紅血球方法 49
期望用途 49
過程準則 49
試劑 50
存儲與穩定性 51
校正品和品管品 52
增益調整 52
校正 52
檢體處理 53

未提供所需材料 53
過程 54
品質管制 54
結果 54
過程限制 54
期望值 55
性能特徵不精確性 55
性能特徵相關數據 55
性能特徵殘留檢體 56
性能特徵分析範圍 56
方法數據摘要 57
CBC 方法數據 57
WBC DIFF 方法數據 58
RETIC 方法數據 59

方法說明

概述

”方法說明”中介紹 ADVIA 2120/2120i 血液分析儀的測試方法中包含的訊息類型。

注意：除非另有說明，否則上述方法的性能數據均爲使用設計用於或指定用於 ADVIA 2120/2120i 血液分析儀系統的 ADVIA 2120/2120i 分析儀、軟體、試劑、標準和品管品獲得。

內容說明

”簡介”中包含有關用於 ADVIA 2120/2120i 血液分析儀的輔助試劑、品管品和校正品的訊息。

相關的方法主題中介紹製備、使用和存儲 ADVIA 2120/2120i 血液分析儀方法試劑的必需過程。

檢體收集和製備



生物危害警告

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，操作者應按照關國臨床實驗室標準化委員會(NCCLS) M29-A號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

請參考標題爲”Sample Handling Guidelines”《檢體處理準則》（出版號 TN9-5729-31）的訊息快報。

使用包含 EDTA 作爲抗凝血劑的血液採樣管或微量檢體血液採集設備。

如果不能在採集後的 8 小時內分析血液檢體，請將其在 2℃至 8℃的環境下冷藏。

不要對低溫檢體進行檢驗！
在混合前，使檢體升溫到室溫。

請勿將檢體放在 37℃的水浴或保溫箱中來使其溫度上升。

警示：如果全血檢體的溫度迅速上升到室溫，則進行混合時血小板極有可能凝結成塊。

請勿使用之前冷凍過的全血檢體。冷凍血液會損傷細胞結果，從而導致細胞計數出錯。

除非另有說明，否則不需要對全血檢體進行特殊處理。不過，必須使用指定的收集管收集檢體，而且在收集時和採樣前都必須小心、徹底地將其混合。

校正品和品管品

警示！潛在生物危害

包含人源材料雖然在製造本產品時使用的每份人血清或血漿捐贈單位已通過FDA批准的方法進行測試，結果證明對乙型肝炎表面抗原(HBsAg)、丙型肝炎抗體(HCV)和 HIV－1/2 抗體無反應，但在處理使用人源材料製造的所有產品時均應將其視為具有潛在傳染性。由於任何測試均不能完全保證不包含乙型肝炎或丙型肝炎病毒、HIV 或者其它感染原，應當按照制定的實驗室管理規範處理這些產品。

Siemens 公司提供用於 ADVIA 2120/2120i 血液分析儀的品管品和校正品。有關其他訊息，請參見最新的價格表以及產品包裝中的插頁。

ADVIA 120 TESTpoint 三合一血液品管品異常 1

REF	產品編號	符號	內容	數量(mL)
09459683	T03-4417–54	CONTROL ABN 1	血液品管品異常 1	4 x 4.0 mL
-	T03-4417-01	CONTROL ABN 1	血液品管品異常 1	4.0 mL

ADVIA 120 TESTpoint 三合一血液品管品異常 2

REF	產品編號	符號	內容	數量(mL)
03410380	T03-4418–54	CONTROL ABN 2	血液品管品異常 2	4 x 4.0 mL
-	T03-4418-01	CONTROL ABN 2	血液品管品異常 2	4.0 mL

ADVIA 120 TESTpoint 三合一血液品管品異常 2

REF	產品編號	符號	內容	數量(mL)
01964346	T03-4416-54	CONTROL NORM	血液品管品正常	4 x 4.0 mL
-	T03-4416-01	CONTROL NORM	血液品管品正常	4.0 mL

ADVIA 120 TESTpoint 血液品管品高

REF	產品編號	符號	內容	數量(mL)
08822644	T03-3688-54	CONTROL HIGH	血液品管品高	4 x 4.0 mL
-	T03-3688-01	CONTROL HIGH	血液品管品高	4.0 mL

ADVIA 120 TESTpoint 血液品管品低

REF	產品編號	符號	內容	數量(mL)
00848547	T03-3686-54	CONTROL LOW	血液品管品低	4 x 4.0 mL
-	T03-3686-01	CONTROL LOW	血液品管品低	4.0 mL

ADVIA 120 TESTpoint 血液品管品正常

REF	產品編號	符號	內容	數量(mL)
05147873	T03-3687-54	CONTROL NORM	血液品管品正常	4 x 4.0 mL
-	T03-3687-01	CONTROL NORM	血液品管品正常	4.0 mL

ADVIA 120 SETpoint 血液校正品

REF	產品編號	符號	內容	數量(mL)
09170071	T03-3685-52	CAL	血液校正品	2 x 6.1 mL
-	T03-3685-01	CAL	血液校正品	6.1 mL

ADVIA 120 OPTIpoint

REF	產品編號	內容	數量(mL)
04408568	T03-3682-54	OPTIpoint	4 x 6.0 mL
-	T03-3682-01	OPTIpoint	6.0 mL

注意：下列各節中介紹 CSF 方法和網狀紅血球方法的品管品。

校正品和品管品值分配方法

根據 NIST、ICSH 或 NCCLS 建議的過程或批准的參考過程和材料爲 ADVIA SETPoint 血液校正品和 ADVIA TESTPoint 血液品管品分配所有目標值。

使用單通道孔徑阻抗計數器，根據建議的方法對參考紅血球(RBC)和白細胞(WBC)計數。微量稀釋 1:WBC 爲 500 比 1：使用 A 類玻璃器皿對 RBC 進行 50,000 比 1 的稀釋。參考血小板計數(Plt)使用血球計和相差顯微鏡執行。Plt 的微量稀釋爲 1:125，使用 1% 的草酸銨作爲稀釋劑。參考血紅素方法使用 NCCLS H-15A 批准的標準方法，採用 ICSH 認可的可跟踪血紅素標準執行。參考微量血細胞比容使用 NCCLS H-7A 批准的標準方法，採用 tripotassium EDTA 作爲抗凝血劑執行。

會爲 ADVIA 120 SETpoint 血液學校正品和 ADVIA 120 TESTpoint 血液品管品分配系統特定目標值(SSV)，即使用通過上述方法分配 RBC、WBC、Plt、Hct 和 Hgb 值的新鮮檢體、正常檢體和全血檢體校正的 ADVIA 2120/2120i 血液分析儀，對每個批次進行檢測。

在使用三種參考油對分析儀進行標準化之後，使用 ADVIA 2120/2120i 血液分析儀分配 ADVIA 120 OPTIpoint 值。使用 NIST 標準對折射計進行校正，再通過該校正計確定每種油的折射率。通過測量 ADVIA 2120/2120i 分析儀的激光波長（作爲溫度的函數）測量折射率。在分配 OPTIPoint 值的過程中，會監測流出物溫度，以使用正確折射率對 ADVIA 2120/2120i 分析儀進行標準化。如果存儲在 2℃至 8℃的環境下，則除非另有說明，否則未開封 ADVIA OPTIpoint (PN T03-3682-01)、ADVIA SETpoint 校正品(PN T03-3685-01)和 ADVIA TESTpoint Reticu 在產品標籤上印刷月份的最後一天（有效期）之前都保持穩定。在開封之後，如使用原容器在 2℃至 8℃的環境下密封存儲，ADVIA OPTIpoint 的有效期爲 7 天。

輔助試劑

操作 ADVIA 2120/2120i 血液分析儀必須使用下列輔助試劑。所有試劑均不得存在顆粒和其他異物。

ADVIA 120 SHEATH/RINSE

REF	產品編號	符號	內容	數量(mL)
02337140	T03-3664-01	SHEATH/RINSE	鞘液／沖洗液	10 L
01554628	T03-3623-01	SHEATH/RINSE	鞘液／沖洗液	20 L

ADVIA 120 EZ KLEEN

REF	產品編號	符號	內容	數量(mL)
05101601	T03-3624-54		EZ KLEEN	4 x 810 mL
-	T03-3624-01	EZ KLEEN	EZ KLEEN	810 mL

ADVIA 120 DEFOAMER

REF	產品編號	符號	內容	數量(mL)
09119084	T03-3625-54		去沫劑	4 x 125 mL
	T03-3625-01	DEFOAMER	去沫劑	125 mL

運行

要通過 ADVIA 2120/2120i 血液分析儀分析檢體，請參考”日常程序”。

注意

計算機磁盤和／或磁盤中所包含程序的任何修改都可能對分析儀性能造成不良影響，從而使結果無效，並且提出有關系統性能的索賠。在任何情況下，Siemens 公司對於因用戶修改或改變磁盤和／或磁盤中所包含程序而引入或造成的錯誤，以及因上述修改或改變造成的所有直接或同接後果不承担任何責任。

結果計算

本分析儀會自動執行爲獲得最終結果所需的全部計算。

通過使用標記算法，實驗室工作人員會對可疑異常狀況保持警覺。相應的標記指示這些狀況（如＊、十和／或用顏色突出顯示）。只要觸發一個標記，用戶就應該檢查結果並執行適當的措施。

注意：ADVIA 2120/2120i 血液分析儀會使用英特爾處理器提供的 64 位浮點數和 IEEE 標準執行所有計算。有效位數為 14。系統會對數字進行捨入，以按適當的單位顯示指定位數。例如，4.674999999 捨入為 4.67，4.675 捨入為 4.68。這會使某些值看上去不一致，如%diff 似乎最高只能累加到 99.9%而不是 100%，或者顯示的 HCT 等推導結果值似乎不正確。

例子： **HCT = RBC*MCV/10.0**

5.349 * 86.49/10 = 46.2635 捨入爲 46.3。
分析儀會將 5.34 * 86.4/10 的值顯示爲 46.1。

結果的解釋

系統操作者和實驗室主管負責按照適用產品標籤（聯機文檔、包裝中的說明書、公告）上說明的規程操作和維護 Siemens 產品，並負責判斷產品性能是否符合相關說明。

如果在上述預先說明的操作和維護環境下，發生實驗室協議中定義的反常或異常結果，則實驗室人員應首先確定是否已按照產品標籤運行和操作系統；然後，根據實驗室協議，向臨床人員說明結果與實驗室規定的正常值不符。

Siemens 產品並不用於對患者進行診斷。Siemens 建議使用本公司的診斷產品（分析儀、試劑、軟體、硬件）收集數據，以反映患者在特定時間的化學、血液學或免疫學狀態。在確定診斷結果和治療療程時，必須將上述數據與其他診斷訊息以及負責醫師對患者狀況的評估一起使用。

Siemens 診斷產品的任何故障（例如，不符合性能規格或不具備預期性能）均應當由實驗室人員通過正確方法解決。產品標籤上的各個部分中說明了各種故障及其可能對結果產生的影響。

廢液處理規定

爲保護環境並鼓勵資源保護而制定的法律法規規定按指定方式處理有毒害或存在生物危害的廢液。ADVIA 2120/2120i 血液分析儀產生的部分廢液有毒害或存在生物危害。實驗室必須執行適當的步驟，明確在處理廢液時底遵守哪些法律法規，然後嚴格遵守這些法律法規。如果需要對分析儀排出物進行採樣，以評估是否遵守適用的規定，實驗室應當與當地政府許可的生物危害廢液處理公司聯繫以獲得幫助。

使用 ADVIA 2120/2120i 血液分析儀產生的主要廢液來自試劑容器、檢體容器、系統廢液以及可由客戶更換的系統組件。ADVIA 2120/2120i 的所有試劑容器均使用可回收的高強度聚乙烯製造。

另外，應當按照主要法規以及對實驗室具有管轄權的機構的要求，對包含人檢體、品管品材料以及所有試劑的檢體容器進行處理。有關與試劑處理相關的所有特殊預防措施的詳細訊息，請參考產品標籤和材料安全數據表。材料安全數據表由 Siemens 公司提供。

廢液分析

運行既定的每日廢液過程並清空廢液容器後，會從在三種分析模式下運行的 ADVIA 2120/2120i 血液分析儀中收集廢液：CBC、CBC/diff 和 CBC/diff/retic。通過使用自動進樣器，在執行每日清洗周期後，可使用新鮮的全新檢體運行 300 個 CBC 分析周期。將廢液充分混合，然後送出檢體以供分析。對於 CBC/diff 和 CBC/diff/retic 分析模式重複該過程。除二甲替甲酰胺(DMF)以外的所有分析均由愛爾蘭 Blessington 的 Tel Labs 完成。

注意：為了對廢液進行管理，注意分析儀在常規 CBC/diff/retic 周期中會產生約 20 mL 廢液，包括鞘液／沖洗液。

除非另有說明，否則濃度爲 mg/L (ppm)。

＜表示濃度低於檢測限值。

＊表示計算的濃度

Analyte	CBC	CBC/Diff	CBC/Diff/Retic
pH	8.5	7.7	7.4
Phosphate 爲 P	460	530	500
氯化物	5445	4268	4273
鋇	< 0.01	< 0.01	< 0.01
銀	< 0.o1	< 0.01	< 0.01

Analyte	CBC	CBC/Diff	CBC/Diff/Retic
砷	< 0.01	< 0.01	< 0.01
硒	< 0.01	< 0.01	< 0.01
汞	< 0.001	< 0.001	< 0.001
鎳	< 0.01	< 0.01	< 0.01
鉻	< 0.01	< 0.01	< 0.01
鋅	0.05	0.05	0.09
鎘	< 0.005	< 0.005	< 0.005
銅	0.02	0.01	0.01
鉛	< 0.01	< 0.01	< 0.01
TOC (g/dL)	0.2	2.1	1.6
氰化物 2.38	0.33	< 0.05	
甲醛*	0	896	720
可吸收有機鹵化物	0.59	1.97	2.32
可清除有機鹵化物 (mg/dL 的氯）	0.52	1.03	2.52
DMF		269	

DMF 由 Siemens 公司根據系統廢液中 autoRETIC 試劑的稀釋物進行處理。

分析儀廢液中的揮發性有機複合物

除非另外說明，否則濃度爲µg/L (ppb)。

＜表示濃度低於檢測限值。

需測定物質	CBC	CBC/Diff	CBC/Diff/Retic
二氯甲	< 25	< 25	< 25
氯傷	3	2	27
三氯乙烷	< 5	< 5	< 5
四氯化碳	< 1	< 1	< 1
苯	< 1	< 1	< 1
二氯乙烷	< 1	< 1	< 1
三氯乙烯	< 1	< 1	< 1

需測定物質	CBC	CBC/Diff	CBC/Diff/Retic
溴二氯甲烷	< 1	< 1	< 1
二溴氯甲烷	< 1	< 1	< 1
四氯乙烷	< 1	< 1	< 1
甲苯	< 1	< 1	< 1
氟利昂-113	< 1	< 1	< 1
四氯乙烯	< 1	< 1	< 1
氯苯	15	5	3
乙苯	< 1	< 1	< 1
m/p 二甲苯	< 1	< 1	< 1
o 二甲苯	< 1	< 1	< 1
六氯丁二烯	< 1	< 1	< 1
四氯甲苯	< 1	< 1	< 1
二氯甲苯	< 1	< 1	< 1
異丙苯	< 1	< 1	< 1
三溴甲烷	< 1	< 1	< 1
苯乙烯	< 1	< 1	< 1
1,3,5-三氯苯	< 1	< 1	< 1
1,2,3-三氯苯	< 1	< 1	< 1
1,2,4-三氯苯	< 1	< 1	< 1
1,2-二氯苯	16	4	2
1,3-二氯苯	< 1	< 1	< 1
1,4 -二氯苯	14	4	2
α-甲基苯乙烯	< 1	< 1	< 1
1,1-二氯乙烯	< 1	< 1	< 1
1,1,2-三氯乙烯	< 1	< 1	< 1
1,1-二氯乙烯	< 1	< 1	< 1
反- 1,2-二氯乙烯	< 1	< 1	< 1
反- 1,2-二氯乙烯	< 1	< 1	< 1

需測定物質	CBC	CBC/Diff	CBC/Diff/Retic
甲基叔丁基醚	< 1	< 1	< 1
乙烯基氯	< 25	< 25	< 25
甲基丙烯酸甲酯	< 5	< 5	< 5
氟利昂-11	< 25	< 25	< 25

系統方法訊息

爲網狀紅血球計數(RETIC)方法、全血細胞計數(CBC)方法和分類(DIFF)方法提供的方法訊息與 CLSI M29-A3 號文件以及關國食品藥品監督管理局的美國聯邦法中第 21 章中的規定一致。

必須起草實驗室操作手冊，作爲實驗室管理規範並保證遵守法規。爲幫助起草實驗室操作手冊，請參考交叉參考資料，其中將我們的方法訊息結構與《臨床實驗室操作手冊》（前 NCCLS）在《*Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition 2005*》CLSI M29-A3 號文件中的建議進行比較。

Siemens Method 訊息具有統一格式，並包含下列類別或章節標題：

期望用途

過程準則

試劑

存儲與穩定性

檢體處理

未提供所需材料

過程

品質管制

增益調整

校正

結果

過程限制

期望值

性能特徵

由美國臨床實驗室標準化委員會提供，地址爲 940 West Valley Road, Suite 1400, Wayne, PA, 19087-1898

系統方法訊息：期望用途

本主題中簡短說明相關檢測的期望用途，即作爲一項試管內診斷過程，對人的全血進行定量分析。

系統方法訊息：過程準則

本主題對檢測進行物理、化學和／或生物學說明，並簡短說明可能的反應。

系統方法訊息：試劑

這些主題介紹執行檢測需要的試劑，包括試劑包裝訊息、產品說明、未提供的所需材料以及試劑製備說明。

下文簡要說明了這些主題中使用的文字符號：

警示！
指示可能導致疾病、灼傷、皮膚過敏等危險。稀釋的酸、弱腐蝕性材料、產生輕微皮膚刺激的材料或易燃材料等物質會引起上述危險。

注意
指示存在影響用戶或性能的特定風險。

注意
指示可幫助確保正確操作分析儀的其他訊息。

注意：客戶必須時刻注意與所有試劑相關的危險和警告。如果有必要，應使用適當的安全裝置（如眼鏡、手套、實驗室服裝）用戶應當遵守 Siemens 公司提供的《材料安全數據表》中規定的處理和安全預防措施。

試劑和校正品製備
試劑和校正品爲現成材料，無需製備。

系統方法訊息：存儲與穩定性

試劑和校正品的存儲方法和有效期印刷在產品標籤上。在未開封存儲的情況下，除非另外說明，否則這些產品直至有效期所指定月份的最後一天都會保持穩定。

系統方法訊息：檢體處理

參數值超出分析範圍的全血檢體可使用自體血漿或等滲鹽水進行稀釋並重新檢測，除非特定方法訊息中另有說明。

系統方法訊息：未提供所需材料

本主題列出除試劑外，執行上述方法需要的其他材料。

系統方法訊息：過程

有關常規的操作說明，請參考”日常程序”。

系統方法訊息：品質管制

本節指定各種方法的建議質量品管品材料和品質管制頻率。一般來說，Siemens 公司建議使用 ADVIA TESTpoint 血液品管品（低、正常和高）以及 ADVIA TESTpoint 網狀紅血球品管品（低、高）監測 ADVIA 2120/2120i 血液分析儀。有關產品說明，請參考第 5 頁。

在開始每個班次或在實驗室選擇的其他間隔時，試劑批號更改後，更換分析模組中可能影響分析性能的任何零部件之後，應對品管品材料進行檢測。在報告患者結果前，實驗室必須評估所有品管品結果。如果品管品結果未能滿足實驗室制定的接受標準，必須評估從不可接受的測試運行中獲取的所有患者測試結果，來確定患者結果是否受到了不利影響。在報告患者結果前，實驗室應當執行相應的糾正操作，如重新校正並重新分析患者檢體等，並將其存檔。

系統方法訊息：增益調整

增益調整過程用於調整頻道中信號的放大率，以有效確定直方圖中細胞信號的位置。

調整增益需要的材料

- 全血
- **ADVIA 120 OPTIPOINT**

REF	**產品編號**	**內容**	**數量(mL)**
04408568	T03-3682-54	OPTIpoint	4 x 6.0 mL
-	T03-3682-01	OPTIpoint	6.0 mL

- **ADVIA 120 SETpoint 校正品**

REF	**產品編號**	**符號**	**內容**	**數量(mL)**
09170071	T03-3685-52		血液校正品	2 x 6.1 mL
-	T03-3685-01	CAL	血液校正品	6.1 mL

系統方法訊息：校正

本主題指定每種方法的校正類型、頻率和過程，並說明應使用的相應校正材料。

校正過程

必須針對除%Retics 以外的所有參數對分析儀進行校正。Siemens 建議使用 ADVIA SETpoint 校正品（產品號 T03-3685-01）。

在下列每一種情況下都應該執行校正：

- 在安裝分析儀時。
- 在更換關鍵硬件組件或試劑批號後，如果檢查增益以後品管品值發生明顯改變。
- 品管品結果和／或移動均值超出範圍，而且已證實該情況與分析儀有關。

系統方法訊息：結果

本主題介紹與分析結果關聯的預期標記和消息。

系統方法訊息：過程限制

本主題介紹已被報告可導致分析結果發生實際或明顯改變的物質、情況和患者狀態。

Siemens 公司已盡最大努力在產品標籤的”故障排除”、”維護”和”參考書目”中說明分析儀、試劑或危險物質會造成的潛在影響，包括對患者結果的已知干擾。但本公司不可能給出適用於所有臨床環境的訊息。本公司提供相關訊息，而不是試圖確定是否需要更多測試，該測試在相應病例中需要進行匡學診斷。由實驗室決定是否報告診斷結果。

系統方法訊息：期望值

期望值的範圍因年齡、性別、飲食、地區等因素而異，建議每間實驗室指定自已的一組期望值範圍。

系統方法訊息：性能特徵

這些主題提供與方法性能特徵有關的技術訊息，包括不精確性、相關數據、分析範圍和殘留檢體。

下面介紹每個統計參數以及用於計算參數的協議：

不精確性

不精確性定義爲對同一檢體進行重複測量的變化程度。

批內不精確性是指在單個批次內檢測檢體時方法的可再現性。

對應的各個方法表中說明每種方法的不精確性值，這是預計分析儀的平均不精確性點估計值。由於這是一個點估計值，使用相似協議測試的所有單台分析儀都會得到不同的不精確性估計值，但不會與發布的平均不精確性相差很大。

相關數據

相關數據是使用人全血檢體，通過將 ADVIA 120 血液分析儀的性能與參照方法或用於比較的分析儀（如果適用）性能相比較而得的。

會使用與 CLSI M29-A3 號文件，《*Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline - Third Edition 2005*》*中所推薦協議相似的協議進行計算。*

除非另有說明，否則每種方法中的回歸數據指示 ADVIA 120 血液分析儀(y)與比較用系統／方法(x)之間的線性最小二乘法擬合。

殘留檢體

本主題列出 ADVIA 120 血液分析儀的殘留檢體。

分析範圍

本主題介紹可通過此方法獲得可接受結果的濃度範圍。

某些檢體可能超出方法的範圍，並生成錯誤標記或消息。

CLSI M29-A3 號文件和 Siemens 方法主題交叉參考

CLSI 核准指南 M29-A3		Siemens Method 主題
5.1.2	**標題**	
5.1.2.1	標題	
5.1.2.2	檢體類型	期望用途
5.1.2.3	副標題中的方法或使用儀器	期望用途
5.1.3	**準則**	
5.1.3.1	相關反應類型	過程準則
5.1.3.2	執行測試的臨床原因	期望用途
5.1.4	**檢體**	
5.1.4.1	說明患者準備的情況	檢體處理／過程限制
5.1.4.2	檢體類型	期望用途／檢體處理
5.1.4.3	檢體處理狀況	檢體處理
5.1.5	**試劑**	
5 1.5.1	列出試劑、耗材和設備	試劑

CLSI 核准指南 M29-A3		Siemens Method 主題
5.1.5.2	製備說明	試劑
5.1.5.3	用於確定可接受的試劑性能的參數	存儲與穩定性／品質管制
5.1.5.4	存儲要求	存儲與穩定性
5.1.6	**校正**	
5.1.6.1	標準製備	不適用
5.1.6.2	校正過程	校正
5.1.7	**品質管制**	
5.1.7.1	確定要使用的品管品材料	品質管制
5.1.7.2	有關製備和處理品管品材料的說明	品管品包裝插頁
5.1.7.3	品管品頻率	品質管制
5.1.7.4	品管品容差限值的說明	品管品包裝插頁
5.1.7.5	超出限值時底採取的糾正措施	根據相應實驗室管理規範
5.1.7.6	記錄和存儲 QC 數據的方法	品質管制／根據相應實驗室管理規範
5 1.7.7	如果品管品不可用，列出備用材料	品質管制（如果適用）
5.1.8	**過程一逐步**	
5 1.8.1	詳細的逐步說明	過程
5 1.8.2	離心過濾要求	不適用
5 1.8.3	指定特殊玻璃器皿	不適用

CLSI 核准指南 M29-A3		Siemens Method 主題
5.1.8.4	指定下列各項以測量光度：	
	儀器類型	不適用
	波長	
	比色杯大小	
	用作空白溶液的溶液	過程
	線性	性能特徵
	原始數據讀取方法	計算
	允許的時間間隔	不適用
	最終溶液的穩定性	不適用
5.1.9	**計算**	
5.1.9.1	提供逐步說明	計算
5.1.9.2	提供等式	計算
5.1.9.3	提供例子	計算
5.1.10	**報告結果**	
5.1.10.1	說明參考範圍	期望值
5.1.10.2	說明向醫師報告結果時使用的過程	根據相應實驗室管理規範
5.1.10.3	有關可接受的報告格式的準則	結果／根據相應實驗室管理規範
5.1.11		**過程說明**
5.1.11.1	說明執行特殊預防措施的原因	檢體處理／限制
5.1.11.2	列出可能的誤差來源	檢體處理／限制
5.1.11.3	包括有幫助的提示	過程
5.1.11.4	可能影響測試有效性的臨床情況	檢體處理／限制
5.1.11.5	可接受的備用過程，期望差	性能特徵

CLSI 核准指南 M29-A3		Siemens Method 主題
5.1.11.6	根據臨床應用放大	根據相應實驗室管理規範
5.1.12	**過程限制**	
5.1.121	說明線性和／或檢測限制	性能特徵
5.1.12.2	說明已知的干擾物質	干擾物質／性能特徵
5.1.13	**參考書目**	
5.1.13.1	文獻參考	參考書目
5.1.13.2	製造商產品文獻	要查看在線文檔的版本，請在幫助窗口的菜單欄中單擊 Options（選項），然後單擊 Version（版本）。
5.1.13.3	教材	
5.1.13.4	標準出版物	
5.1.13.5	書面的個人通信材料	
5.1.13.6	包括方法驗證支持數據的研究	

CBC 方法

期望用途

ADVIA 2120/2120i 血液分析儀全血細胞計數(CBC)方法用於定量地測量下列血液學參數：

白細胞計數(WBC)

白細胞計數(RBC)

血紅素濃度(HGB)

紅血球比容(HCT)

平均紅血球體積(MCV)

平均紅血球血紅素含量(MCH)

平均紅血球血紅素含量(MCHC)

平均紅血球血紅素含量（CHCM）

血紅素細胞含量(CH)

紅血球容積分布寬度(RDW)

血紅素濃度分布寬度(HDW)

血小板計數(PLT)

平均血小板體積(MPV)

過程準則

WBC 計數

全血檢體與包含酸和表面活性劑的 ADVIA 120 BASO 試劑混合。紅血球會被溶解，然後使用 2 角度激光散射信號分析白細胞。

參考書目

Cremins J and Orlik J: Leukocyte differential method. US Patent 5,518,928 (1996)

RBC／血小板計數

使用 ADVIA 120 RBC/PLT 試劑適當地稀釋血檢體後，使用單個光學細胞儀分析紅血球和血小板。紅血球是一個等容球形並使用少量戊二醛固定以保持球形形狀。使用具有 2 種不同增益設置的通用檢測器計算來自信號的紅血球和血小板。

在 ADVIA 2120/2120i 血液分析儀上，血小板信號放大爲明顯超過 RBC 信號。對每個計數進行巧合校正，所以對較大範圍內的每種細胞類型進行準確計數。

參考書目

Kim YR and Ornstein L: Isovolumetric sphering of erythrocytes for more accurate and precise cell volume measurement by flow cytometry. *Cytometry* 3(b): 419-427 (1983)

Zelmanovic, *et al*: US Patent pending

RBC／血小板大小

確定紅血球和血小板大小的方法使用在 2 個不同角度間隔散射激光的同時測量，過能夠消除細胞血紅素濃度的變化對確定細胞體積的不利影響。

參考書目

Kerker M: The Scattering of Light and Other Electromagnetic Radiation. Academic, New York, NY, Chapter 3 (1969)

Groner W and Tycko DH: Characterizing blood cells by biophysical measurements in flow. *Blood Cells* 6: 141-157 (1980)

血紅素濃度

血紅素方法是對國際血液學標準委員會(ICSH)開發的手動氰變性血紅素方法的修改。

參考書目

ICSH Recommendations for Reference Method for Hemoglobinometry in Human Blood, ICSH Standard EP 6/2 (1977)

Specifications for international hemoglobincyanide reference preparation ICSH Standard EP 6/e (1977). *J Clin Pathol* 31: 139 (1978)

指數

紅血球指數 MCH 和 MCHC 是根據 RBC 計數、血紅素總量和 MCV 進行的數學計算得來的。

HCT 值使用 RBC 計數和 MCV 計算。

RDW 和 HDW 值是通過逐個細胞地測量細胞體積和血紅素濃度計算得來的。

CH 代表細胞血紅素含量直方圖的均值。

CHCM 計算力 RBC 血紅素濃度直方圖的均值。

參考書目

Wintrobe MM: The size and hemoglobin content of the erythrocyte. *J Lab Clin Med* **17**: 899-911 (1932)

Bessman JD: What's an %RDW? *Am J Clin Pathol* **76**: 242 (1981)

Mohandas N, et al: Accurate and independent measurement of volume and hemoglobin concentration of individual red cells by laser light scattering. *Blood* **68**: 506-513 (1986)

試劑

需要下列現成的試劑，以執行 CBC 方法和維護 ADVIA 2120/2120i 血液分析儀。必須與鞘液／沖洗液一起使用 CBC TIMEPAC 或 CN-FREE CBC TIMEPAC。

ADVIA 120 CBC TIMEPAC

REF	產品編號	符號	內容	數量(mL)
09826813	T01-3620-52		CBC TIMEPAC	
-	T01-3625-01	DEFOAMER	去沫劑	1 x 75 mL
-	T01-3627-01	RBC/PLT	RBC/PLT	2 x 2700 mL
-	T01-3628-01	HGB	HGB	2 x 1100 mL
-	T01-3629-01	BASO	BASO	2 x 1100 mL

ADVIA 120 CN-FREE CBC

REF	產品編號	符號	內容	數量(mL)
08008297	T01-3626-52		CN-FREE CBC TIMEPAC	
-	T01-3625-01	DEFOAMER	去沫劑	1 x 75 mL
-	T01-3627-01	RBC/PLT	RBC/PLT	2 x 2700 mL
-	T01-3629-01	BASO	BASO	2 x 1100 mL
-	T01-4288-01	HGB	CN-FREE HGB	2 x 1100 mL

ADVIA 120 SHEATH/RINSE

REF	產品編號	符號	內容	數量(mL)
02337140	T01-3664-01	SHEATH/RINSE	鞘液／沖洗液	10 L
01554628	T01-3623-01	SHEATH/RINSE	鞘液／沖洗液	20 L

ADVIA 120 DEFOAMER

(PN T01-3625-01) 1 x 75 mL

ADVIA 120 去沫劑包含：

硅乳液，100%

使用前搖勻。

用於*試管內*診斷使用。

ADVIA 120 RBC/PLT

(PN T01-3627-01) 2 x 2700 mL

ADVIA 120 RBC/PLT 包含：

十二烷基硫酸鈉，0.035 mmol/L

EDTA 二鈉鹽，4.03 mmol/L

EDTA 二鈉鹽，3.36 mmol/L

氯化鈉，109.3 mmol/L

戊二醛，0.11%

緩衝劑

用於*試管內*診斷使用。

ADVIA 120 HGB

(PN T01-3628-01) 2 x 1100 mL

ADVIA 120 HGB 包含：

氰化鉀，23 mmol/L

甲基氧化月桂胺，2.0%



R20/21/22
S24/25, S29, S36/37, S45

有害！

吸入、皮膚接觸或吞食均有害。避免接觸皮膚和眼睛。佩戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼標籤）。請勿排放到排水溝中。

用於*試管內*診斷使用。

ADVIA 120 BASO

(PN T01-3629-01) 2 x 1100 mL

ADVIA 120 BASO 包含：

鹽酸，9.00 mmol/L

鹽酸，21.49 mmol/L

防腐劑

表面活性劑

用於*試管內*診斷使用。

ADVIA 120 CN-FREE HGB

(PN T01-4288-01) 2 x 1100 mL

ADVIA 120 CN-FREE HGB 包含：

甲基氧化月桂胺，2.0%

用於*試管內*診斷使用。

ADVIA 120 SHEATH/RINSE

(PN T01-3664-01) 1 x 10 L

(PN T01-3623-01) 1 x 20 L

ADVIA 120 SHEATH/RINSE 包含：

防腐劑

緩衝劑

表面活性劑

用於*試管內*診斷使用。

存儲與穩定性

試劑

存儲在 15℃至 30℃的環境下：

- 未開封試劑在產品標籤上印刷的有效期內是穩定的。
- 已開封 ADVIA 120 BASO 試劑、ADVIA 120 HGB 試劑和去沫劑在 90 天內是穩定的。
- 已開封 ADVIA 120 SHEATH/RINSE 試劑以、ADVIA 120 RBC/PLT 試劑以在 45 天內是穩定的。

避免產品冷凍。

存儲在 2℃至 8℃環境時，除非另有說明，否則未開封 ADVIA OPTIpoint (PN T03-3682-01)、ADVIA SETpoint 校正品（產品號 T03-3685-01）和 ADVIA TESTpoint 血液品管品（分別爲產品號 T03-3686-01，低；T03-3687-01，正常；T03-3688-01，高）在產品標籤上印刷月份的最後一天（有效期）之前都保持穩定。

在開封後，如使用原容器在 2℃至 8℃的環境下密封存儲，ADVIA OPTIPoint 在 7 天內穩定，ADVIA TESTpoint 血液品管品在 10 天內穩定，ADVIA SETpoint 校正品在 5 天內穩定。

增益調整

增益調整過程用於調整頻道中信號的放大率，以有效確定直方圖中細胞信號的位置。

校正

必須針對除%Retics 以外的所有參數對分析儀進行校正。Siemens 建議使用 ADVIA SETpoint 校正品（產品號 T03-3685-01）。

在下列情況下底執行校正過程：

- 在安裝分析儀時。
- 在更換關鍵硬件組件或試劑批號後，如果檢查增益以後品管品值發生明顯改變。
- 品管品結果和／或移動均值超出範圍，而且已證實該情況與分析儀有關。

檢體處理

檢體收集

使用包含 EDTA 作爲抗凝血劑的採血管收集全血。如果不能在採集後的 8 小時內分析血液檢體，請將其在 2℃至 8℃的環境下冷藏。如果已將檢體冷藏，在混合前，使該檢體升溫到室溫（15℃至 30℃）。

檢體稀釋

參數值超出分析範圍的全血檢體可使用自體血漿或等滲鹽水進行稀釋並重新檢測。

檢體穩定性

使用 ADVIA 120 血液分析儀對血液老化的影響進行 72 小時以上的研究。從 15 位正常、明顯健康的捐贈人獲得的兩份全血檢體在採集後立即進行檢測，然後按照 8、24、36、48、56 和 72 小時的間隔進行檢測。

將來自每一組的全新檢體之一存儲在室溫下，而對照檢體在 2℃至 8℃下存儲在包含 EDTA 作爲抗凝血劑的密封採血管中。

結果說明 CBC 參數穩定在按指定時間間隔進行初次獲得的二(2)個標準差（在運行精度內）內。計算參數的穩定性取決於最不穩定的主要參數的穩定性。

參數	室溫穩定性（小時）	冷藏溫度穩定性（小時）
WBC ($10^3/\mu L$)	36	56
RBC ($10^6/\mu L$)	48	72
HGB (g/dL)	72	72
MCV (fL)	8	24
CH (pg)	36	53
CHCM (g/dL)	8	24
RDW (%)	72	72
HDW (g/dL)	72	72
PLT ($10^3/\mu L$)	48	48
MPV (fL)	8	8

未提供所需材料

對於 ADVIA 2120/2120i 血液分析儀，執行 ADVIA 2120/2120i CBC 方法需要的其他材料包括不同的品管品材料、校正品、ADVIA OPTIpoint 以及”方法說明”一節中指定的其他試劑或設備。

過程

要通過 ADVIA 2120/2120i 血液分析儀分析檢體，請參考”日常程序”。

品質管制

建議使用 ADVIA TESTpoint 血液品管品來控制分析儀。有關產品說明，請參考第 5 頁。這些品管品用於與臨床實驗室自身的品質管制計劃和過程相結合。

在下列情況下應對品管品材料進行檢測：

- 每個班次開始時或實驗室選擇的其他時間間隔。
- 試劑批號更改後。
- 更換分析模組中可能影響分析性能的任何零部件之後。

實驗室可以選擇定期測試保留的患者檢體，以監測性能趨勢。

結果

ADVIA 2120/2120i 血液分析儀會自動執行爲獲得最終結果所需的全部計算。

通過使用標記算法，實驗室工作人員會對可疑異常狀況保持警覺。相應的標記指示這些狀況（如＊、十和／或用顏色突出顯示）。只要觸發一個標記，用戶就應該檢查結果並執行適當的措施。

過程限制

過程限制如下所示：

1. 鐮狀細胞貧血病例中出現的部分不可改變的鐮狀細胞在分析儀中不可能顯示爲完全的球形，過導致 RDW 增加並低估 MCV。鐮狀細胞可能導致其他 RBC 參數的結果錯誤。
2. WBC 計數過高(> 200 x 10^3 cells/μL)會導致紅血球計數上升。
3. 包含冷凝集素的檢體可能會導致紅血球計數虛降。
4. WBC 計數過高(> 60 x 10^3 cells/μL)或血小板凝集的檢體，以及新生兒檢體都會干擾血紅素的確定。

5. 血脂和乳糜粒脂蛋白過高／過低，或者膽紅素過高的檢體會干擾並導致通過血紅素方法獲得的血紅素結果過高，包括 MCHC。

 由於上述干擾不影響通過 RBC 方法獲得的每個細胞血紅素濃度值，所以不影響 CHCM 值。如果 MCHC 和 CHCM 相差 1.9 g/dL 以上，會顯示“Comparison Error”（比較錯誤）系統標記，以向操作者發送關於該狀況的警告。

6. 包含有核 RBC 的患者檢體（特別是新生兒檢體）可能導致 WBC 計數虛高。在手動更正存在 NRBC 時的 WBC 計數時，使用 WBCB 計數。

7. 對於接受全靜脈營養(TPN)的患者，其檢體的血小板計數可能會虛高。這些檢體可能包含出現在血小板計數區中的脂肪滴，導致血小板計數升高。

期望值

期望值的範圍因年齡、性別、飲食、地區等因素而異。建議每間實驗室指定自己的一組期望值範圍。

下列期望值範圍基於對假設健康的成年人群體的 60 份全血檢體的重複檢測。

參數	低值	高值
WBC ($10^3/\mu L$)	3.8	8.6
RBC ($10^6/\mu L$)	4.1	6.0
HGB (g/dL)	10	16
HCT (%)	33	57
MCV (fL)	76	100
MCH (pg)	24	31
MCHC (g/dL)	28	34
CH (pg)	24	35
CHCM (g/dL)	29	34
RDW (%)	12	15
HDW (g/dL)	1.9	3.0
PLT ($10^3/\mu L$)	140	360
MPV (fL)	7	9

性能特徵不精確性

使用多個檢體執行共 18 次測試。

下列不精確性估計值是通過對每個全血檢體進行 25 次吸取獲得的。每種檢體選擇模式均通過從開放管採樣進行測試，並使用手動和自動的密封管進樣器。

參數	均值	標準差	CV (%)
WBC ($10^3/\mu L$)	5.91	0.16	2.7
RBC ($10^6/\mu L$)	4.82	0.05	1.0
HGB (g/dL)	13.3	0.11	0.8
MCV (fL)	81.0	0.3	0.4
CH (pg)	26.5	0.05	0.2
CHCM (g/dL)	30.6	0.14	0.5
RDW (%)	12.3	0.07	0.6
HDW (g/dL)	2.56	0.02	0.8
PLT ($10^3/\mu L$)	256	6.9	2.7
MPV (fL)	8.1	0.11	1.4

性能特徵相關數據

ADVIA 120 血液分析儀的性能與 Technicon H•3 RTC 分析儀(x)進行比較，期間使用來自 60 個正常捐贈者和 70 個醫院捐贈者的全血，且每個檢體均重複檢測(n = 260)。

下列回歸統計量使用與 NCCLS EP9-A 號文件，《*Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline (1995)*》中所推薦協議相似的協議進行計算。

參數	比較用分析儀或方法	回歸等式(y =)	r	Sy.x
WBC ($10^3/\mu L$)	Technicon H•3 RTC	1.06x - 0.74	0.997	1.42
RBC ($10^6/\mu L$)	Technicon H•3 RTC	0.98x + 0.11	0.997	0.07
HGB (g/dL)	Technicon H•3 RTC	1.01x - 0.2	0.997	0.2
MCV (fL)	Technicon H•3 RTC	0.90x + 9.6	0.994	1.1
CH (pg)	Technicon H•3 RTC	1.00x + 1.2	0.990	0.6
CHCM (g/dL)	Technicon H•3 RTC	1.17x - 6.5	0.974	0.5
RDW (%)	Technicon H•3 RTC	0.86x + 1.3	0.980	0.6
HDW (g/dL)	Technicon H•3 RTC	0.98x + 0.06	0.959	0.13

參數	比較用分析儀或方法	回歸等式(y =)	r	Sy.x
PLT ($10^3/\mu L$)	Technicon H•3 RTC	1.08x - 2.0	0.991	27
MPV (fL)	Technicon H•3 RTC	0.76x + 0.9	0.925	0.4

x = Technicon H•3 RTC 分析儀

y = ADVIA 120 血液分析儀

性能特徵：攜帶率

ADVIA 120 血液分析儀會測定 WBC、RBC、HGB、PLT 等參數的檢體攜帶率≦1%。

ADVIA 120 血液分析儀測定的攜帶率參數的計算是通過先吸取爲進行線形測試準備的高混合檢體，然後三次吸取無細胞血漿。檢體攜帶率百分比計算爲：

%攜帶率＝

$\mathbf{L_1}$

$\mathbf{L_2}$

H＝來自高度混合的檢體的計數

參數	計算得到的攜帶率
WBC	0.4%
RBC	0.2%
HGB	0.2%
PLT	0.1%

性能特徵：分析範圍

ADVIA 2120/2120i 血液分析儀的分析範圍的確定是通過專門選定的高值檢體進行一系列梯度稀釋，然後對專門準備的混合檢體進行多次測定。

參數	評估範圍	觀察到的最大偏差
WBC ($10^3/\mu L$)	0.02 至 21.83	0.46 x $10^3/\mu L$
	20.48 至 409.55	4.1%
RBC ($10^6/\mu L$)	0.0 至 2.65	0.03 x $10^6/\mu L$
	2.65 至 6.76	1.1%

參數	評估範圍	觀察到的最大偏差
HGB (g/dL)	0.0 至 8.6	0.2 g/dL
	8.6 至 22.5	2.5%
PLT ($10^3/\mu L$)	5 至 208	10 x $10^3/\mu L$
	205 至 3983	4.9%

CSF 方法

期望用途

ADVIA 2120/2120i 血液學腦脊液(CSF)檢測用於體外檢測，以確定腦脊液(CSF)檢體中血細胞的數量。CSF 檢測提供白血球(CSF WBC)和紅血球(CSF RBC)計數，以及 CSF WBC 分類的絕對值和百分比計數。在確定診斷結果和治療療程時，應當將 CSF 檢測結果與其他診斷訊息以及負責醫師對患者狀況的評估一起使用。

過程準則

過去，實驗室一直使用手動細胞計數和分類方法執行對 CSF 檢體的血液學分析。正常 CSF 檢體中的血細胞數量一般很低。WBC 計數能夠爲各類顱腦疾病的區分診斷提供重要的臨床訊息。CSF 中的 WBC 計數用於診斷細菌性腦膜炎，病毒性腦膜炎和真菌性腦膜炎、腦炎、種經紊亂的區分診斷，CSF 相關的白血病診斷，並在白血病和淋巴瘤中監測對患者的治療。WBC 計數升高以及中性粒細胞增加通常說明患有細菌性腦膜炎。對於病毒性腦炎，主要爲單核細胞，細胞計數較低。RBC 計數異常升高可能說明腦出血或創傷性腰椎穿刺。

ADVIA 120 CSF 檢測通過統計並區分某些細胞類型，提供快速、自動的 CSF 檢體分析。在使用 ADVIA 120 CSF 檢測時，CSF 檢體與 ADVIA 120 CSF 試劑混合，後者會包圍並固定細胞。經過最少 4 分鐘至 4 小時的保溫期後，會直接將製備的檢體吸取到 ADVIA 120 分析儀中。然後，會根據使用 ADVIA 120 光學器件測量的光線散射和吸收值，檢測並確定各類細胞的數量。會顯示散射與散射以及散射與吸收直方圖，並且爲每個檢體自動計算閾值和結果。可報告參數包括 WBC 和 RBC 計數以及嗜中性粒細胞、淋巴細胞、單核細胞、中性粒細胞(PMN)和單核(MN)細胞的絕對計數和百分比計數。此外，還提供了僅供參考的嗜酸性粒細胞計數。

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試劑

ADVIA 120 CSF 試劑

REF	產品編號	符號	內容	數量(mL)
0427197	T01-4610-01	CSF REAGENT	CSF 試劑	1 x 8 mL
-	T01-4611-01	CSF REAGENT	CSF 試劑	8 mL

ADVIA 1 20 CSF 試劑是包含包圍試劑和固定劑的緩衝溶液。ADVIA 1 20 CSF 試劑（產品號 T01-4610-01）包含一個 8 mL 瓶，其中裝有足以分析 25 份檢體或品管品的試劑。

ADVIA 1 20 CSF 試劑包含：

甲醛，2% (Wt)

戊二醛，0.28% (Wt)

緩衝劑

表面活性劑



R40, R43
S36/37

有害！有刺激性！

包含 2% (Wt)的甲醛。致癌效應的有限證據。皮膚接觸可能引起過敏。佩戴適當的防護服和防護手套。

用於*試管內*診斷使用。

存儲與穩定性

試劑

存儲在 18℃至 30℃的環境下：

- 未開封試劑在產品標籤上印刷的有效期內是穩定的。*請勿冷凍*。
- 開封的 ADVIA 120 CSF 試劑容器可在一個月內保持穩定。
- 產品應透明、無色且無可見顆粒。如果產品混濁、污染或包含可見物質，請勿使用。

品管品

存儲在 2℃至 8℃的環境下：

- 直接存儲未開封的品管品時，在產品標籤上印刷的有效期內是穩定的。*請勿冷凍*。
- 開封容器可在 10 天內保持穩定。

增益調整

增益調整過程用於調整頻道中信號的放大率，以有效確定直方圖中細胞信號的位置。不需要進行 CSF 特定的增益調整。

校正

CSF 檢測無需進行校正。通過正確調整 RBC 增益可以準確地對細胞進行計數。

檢體處理

檢體稀釋

在製備 CSF 試劑之前，最高可以按 1:10 的比率稀釋檢體〔1 份檢體和 9 份磷酸鹽緩衝鹽水(PBS)或生理食鹽水〕。檢體

檢體穩定性

CSF 患者檢體不穩定，應在採集後盡快對其進行檢測。Siemens 公司建議在採集後的 1 小時內，使用 CSF 試劑製備 CSF 患者檢體。使用 CSF 試劑以製備後，如果存儲在 18℃－30℃的環境中，製備的檢體可在 4 分鐘到 4 小時內保持穩定。

製備的 CSF 患者檢體和製備的 ADVIA 120 TESTpoint CSF 品管品分別含有 1%和 1.5%的甲醛。應按照當地的環境法規處理這些物質。

檢體和品管品製備

使用以下過程製備 CSF 檢體或品管品產品，以便使用 ADVIA 2120/2120i 血液分析儀進行分析。

注意：CSF 檢測需要體積為 300µL 的 CSF 檢體。保留足夠體積的檢體，以便在必要時製備塗片或進行其他測試。RBC 計數高的檢體可能需要在使用 CSF 試劑製備之前進行稀釋。雖然也可能使用生理食鹽水，但磷酸鹽緩衝鹽水(PBS)是這些檢體的首選稀釋液。使用生理食鹽水稀釋的檢體應在稀釋後立即使用 CSF 試劑製備，而且與未稀釋檢體和使用 PBS 稀釋的檢體相比需要更長升溫期。

1. 使用帶標籤的玻璃或塑料試管，將 300µL 完全混合的 CSF 檢體（患者或品管品）添加到 300µL 的 CSF 試劑中。
2. 蓋好試管，輕輕顛倒試管 5 到 10 次或晃動 5 秒鐘，以混合製備的檢體。請小心處理，避免出現泡沫。
3. 在室溫下使其升溫至少 4 分鐘。應在製備後的 4 小時內對檢體進行檢測。
4. 在製備檢體後，更換試劑蓋，然後重新冷藏存儲所有品質管制材料。
5. 上升到適當溫度後，顛倒試管 5 到 10 次或晃動 5 秒鐘以混合檢體，然後立即使用 ADVIA 2120/2120i 血液分析儀吸取檢體。由於黏性較低，所製備 CSF 檢體中的細胞將很快澄清。

未提供所需材料

對於 ADVIA 2120/2120i 血液分析儀，執行 ADVIA 120 CSF 方法需要的其他材料包括不同的品管品材料、校正品、ADVIA OPTIpoint 以及”方法說明”一節中指定的其他試劑或設備。

測試 CSF 檢體的過程

要使用 ADVIA 120 血液分析儀測試 CSF 檢體，請執行以下過程：

1. 如果 Standby（待機）指示灯點亮，請按下 Standby（待機）按鈕，使系統切換到 Ready to Run（做好運行準備）模式。

2. 使用 Order Entry（工單輸入）選項卡，爲要分析的每份 CSF 檢體製備創建一份工單。在 Ocom 字段中輸入檢體的物理特徵，必要時在 Dil（稀釋）字段中輸入稀釋因子。輸入 **CSF** 作爲檢體類型，然後選擇 Tab 鍵以顯示正確的測試菜單。

3. 在 Routine Operations（日常操作）菜單中，選擇 **Manual Sample ID（手動檢體 ID）**選項卡。

4. 選擇 **Cerebrospinal Fluid（腦脊液）**按鈕。

5. 選擇 **Initialize（初始化）**以清洗通道，並獲得流通池本底計數。分析儀完成初始化周期且檢體吸取燈變爲綠色後，檢查流通池通道中的本底計數是否在可接受的限制內。如果本底計數不可接受，請吸取一次 25%的漂白液，然後吸取兩次蒸餾水或鹽水。這些限值的建議值如下：

 CSF R 計數＝0
 CSF PHA WBC＝0
 CSF PHA Total ＜＝10
 如果本底計數不可接受，請吸取一次 25%的漂白液，然後吸取兩次蒸餾水或鹽水。

 注意：CSF Wash（CSF 清洗）周期會沖洗檢體通道，而不會執行本底計數。CSF Refresh（CSF 刷新）周期會刷新流通池本底計數，但不會沖洗檢體通道。本底計數存儲在啟動日誌中。

6. 選擇 **Primer（標本）**作爲 Sample Type（檢體類型），然後選擇 **OK（確定）**。吸取一份鹽水標本，確試檢體通道的本底計數在可接受的限值內。確保在吸取之前，狀態欄上已顯示 **Primer（標本）**。

7. 如果本底計數是可接受的，請繼續執行第 8 步。如果該計數不可接受，請吸取一次 25%的漂白液，再吸取三次蒸餾水或鹽水，之後重複第 5 步和第 6 步。

8. 選擇正確的檢體類型，然後在 Manual Sample ID（手動檢體 ID）框中輸入檢體或品管品訊息，或者掃描檢體試管上的條碼。請勿使用包含選擇編碼的檢體條碼標籤輸入檢體標識。

 警示：在使用手動開管進樣器吸取檢體前，確保狀態欄中顯示正確的檢體 ID 和檢體類型。

9. 上升到適當溫度後，顛倒試管 5 到 10 次或晃動 5 秒鐘以混合檢體，然後立即使用 ADVIA 120 血液分析儀吸取檢體。由於黏性較低，所製備 CSF 檢體中的細胞將很快澄清。

10. 吸取檢體。

 a. 擺好試管的位置，以便檢體探針插入混合好的檢體中。檢體探針不得接觸測試試管的表面，這會導致檢體不能順暢地流入探針。

b. 按下吸液板。在吸液期間，採樣燈一直閃爍。完成檢體吸取需要約 6 秒鐘，而且將使用幾乎全部的已製備檢體。在採樣燈停止閃爍之前，不要取出檢體。在 CSF 模式下，不會顯示 Probe Clog（探針堵塞）消息以指示檢體吸取未完成。請在吸取過程中試真觀察檢體，確保在整個吸取過程中檢體探針都位於檢體液面以下。

c. 採樣燈停止閃爍時，取出試管。

11. *所有* CSF 檢體的分析完成後，您可能希望恢復全血操作，請選擇 **Exit（退出）**。分析儀會自動返回 Whole Blood Manual Sample ID（全血手動檢體 ID）窗口。

在測試至少一個檢體或任何周期後退出 CSF 操作時，分析儀會詢問您是否確實要退出。選擇 **OK（確定）**離開 Cerebrospinal Fluid (CSF)（腦脊液）窗口。選擇 **Cancel（繼續）**可繼續使用 CSF 功能。

注意：如果在 CSF 模式下處理過任何檢體或曾運行任何周期，系統會執行一個清洗退出周期。如果在 CSF 模式下未測試檢體或運行周期，系統會直接退出 CSF 模式。

提示

如果仍然處於 CSF 模式的分析儀已切換到 Standby（待機），而且您希望退出 CSF 模式以運行全血檢體，請在退出待機前切換到全血操作。這可以避免不必要地使用較多試劑。

品質管制

CSF 檢測的品質管制使用 ADVIA 120 TESTpoint CSF 品管品（分別包含 1 級和 2 級品管品）執行。這些品管品用於與臨床實驗室自身的品質管制計劃和過程相結合。按照包裝插頁上的說明，對品管品產品進行檢測。

REF	產品編號	符號	內容	數量(mL)
00872863	T03-4485-01		CSF 品管品	2 x 3 mL
-	T03-4486-01	CONTROL CSF 1	品管品級別 1	3 mL
-	T03-4487-01	CONTROL CSF 2	品管品級別 2	3 mL

在下列情況下應對品管品材料進行檢測：

- 每個班次開始時或實驗室選擇的其他時間間隔。
- 試劑批號更改後。
- 更換分析模組中可能影響分析性能的任何零部件之後。

注意：對於 CSF 結果，不可能計算移動均值。

結果

系統會自動執行爲獲得未稀釋檢體的結果需要的所有計算（按 1:1 的比率使用 CSF 試劑以製備）並在 Run Screen（運行屏幕）上顯示它們。

應當針對過程限制中列出的情況，對 ADVIA 2120/2120i 結果進行檢查。如果檢體處於列出的任何狀態，就應當對結果進行確試。

必須使用稀釋因子，對在使用 CSF 試劑製備前已經用 PBS 或生理食鹽水稀釋的檢體結果進行更正。如果檢體已被稀釋，則應當將絕對計數乘以稀釋因子。創建工單時，在 Order Entry（工單輸入）選項卡的 Dil.（稀釋）字段中輸入稀釋因子。Review/Edit（檢查／編輯）選項卡中顯示以及最終患者報告中列印的結果將自動使用輸入的稀釋因子更正。例如，如果按 1:5（1 份檢體和 4 份生理食鹽水或 PBS）對檢體稀釋，則絕對計數將乘以 5。分類百分比不受稀釋影響，所以在 Review\Edit（檢查／編輯）選項卡中進行更正時也不乘以稀釋因子。不使用稀釋因子更正 Run Screen（運行屏幕）中的結果。

爲 CSF 分析啓用 Laser Power Low (PL)（激光能量低）系統標誌。

通過在 Data Manager（數據管理器）中設置的範圍定義，爲所有 CSF 參數提供 High/Low（高／低）標記。

過程限制

過程限制如下所示：

1. 對於 WBC 計數低於 20 細胞／μL 的檢體，應使用備用方法確試 CSF WBC 百分比分類結果。
2. ADVIA 120 CSF 檢測可以準確分析最高爲 1500 RBC/μL 的檢體。應當使用 PBS，按照最高 1:10 的比率，對懷疑含有 1500 RBC/μL 以上的檢體進行稀釋。
3. ADVIA 2120/2120i 血液分析儀不提供形態學標記來指示 CSF 檢測中的異常細胞。僅爲 CSF 檢測啓用 High/Low（高／低）標記和 Laser Power Low（激光能量低）系統標記。
4. 如果對檢體的處理不妥當，或者沒有檢查 CSF 直方圖中是否存在可能的干擾／分析僞影，可能會生成錯誤的結果。錯誤處理檢體的例子包括但不限於：
 - ◆ 在 ADVIA 120 上開始吸取之前，CSF 患者檢體或製備的檢體沒有充分混合
 - ◆ 在 ADVIA 120 上未吸取足夠檢體
 - ◆ 吸取時間不足

- 如果檢體中的蛋白質總量爲 500 到 1000 mg/dL，應在使用 CSF 試劑製備後的 1 小時內對其進行分析。如果蛋白質濃度上升，會導致所製備檢體中的細胞和蛋白質沉澱。

- ADVIA 120 CSF RBC 計數不提供腦出血或創傷性腰椎穿刺導致 CSF RBC 計數升高之間區別的訊息。

干擾物質

- 包含油脂或脂肪污染物的檢體可能會干擾 ADVIA 120 細胞計數。避免使用硅等油脂污染物潤滑血液採集管的瓶塞。
- 在 RBC 計數大於 1500 細胞／μL 的檢體中，RBC 置信事件可能導致 CSF WBC 計數虛假升高且 CSF WBC 分類不正確。應使用 PBS 將上述檢體稀釋到可接受的 RBC 限值，然後使用 CSF 試劑製備該檢體並重新分析。
- 對於在使用 CSF 試劑製備前已使用生理食鹽水稀釋的檢體中的 RBC，需要較長時間進行升溫以包圍檢體中的 RBC。CSF 檢體的首選稀釋劑是 PBS。對於使用生理食鹽水稀釋的檢體，必須在稀釋後立即使用 CSF 試劑進行製備，而且必須升溫 10 分鐘以保證完全包圍 RBC。含有小紅血球和／或著色過淺 RBC 成分的檢體可能導致 CSF RBC 計數虛低。
- 含有未能完全包圍的 RBC 成分的檢體可能導致 CSF WBC 計數虛高且 CSF WBC 分類不正確。
- 芽生酵母表可能覆蓋 CSF RBC 和 CSF WBC 計數區，導致 CSF RBC 和 WBC 計數虛高。

期望值

CSF 檢測的期望值範圍會因患者年齡或其他患者特徵而異。建議每間實驗室基於自身的患者人群指定自已的一組期望值範圍。下列期望值範圍基於使用 ADVIA 120 對 52 份已通過手動方法確試正常的檢體進行分析的結果。

參數	期望值
WBC（細胞／μL）	0-10
MN（細胞／μL）	0-10
PMN（細胞／μL）	0-4

性能特徵精度

通過重複吸取足夠容量的 16 份 CSF 患者檢體評估 ADVIA 120CSF 檢測的運行精度。容量可供吸取 2 到 10 次 CSF 檢體。在總檢體數力 n = 65 的情況下，匯集來自 16 份檢體的結果。

CSF WBC 計數精度(n = 65)

參數	均值	SD	CV
WBC	44.6	5.0	11.2

CSF RBC 計數精度(n = 65)

參數	均值	SD	CV
RBC	12.9	4.1	31.7

CSF RBC 計數精度(n = 65)

參數	均值	SD	CV
%NEUT	12.5	3.2	25.5
%LYMPH	74.9	5.1	6.9
%MONO	8.3	3.2	39.3
%MN	83.2	3.6	4.3
%PMN	16.8	3.6	21.2
#NEUT	4.8	1.1	23.6
#LYMPH	33.8	4.0	11.7
#MONO	4.1	1.2	30.1
#MN	37.9	4.7	12.4
#PMN	6.6	2.0	29.9

性能特徵準確性

CSF WBC 計數的準確性通過將來自 90 份檢體的手動計數與來自 ADVIA 120 血液分析儀的計數進行比較來評估。下表提供了準確性統計結果。

CSF WBC 計數

CSF WBC 計數的準確性通過將來自 90 份檢體的手動計數與來自 ADVIA 120 血液分析儀的計數進行比較來評估。下表提供了準確性統計結果。

R	斜率	截距	Syx	手動均值	ADVIA 120 均值	偏差
0.981	1.38	2	14	20	30	10

CSF RBC 計數

CSF RBC 計數的準確性通過將來自 78 份 CSF 患者檢體的手動計數與來自 ADVIA 120 血液分析儀的計數進行比較來評估。下表提供了準確性統計結果。

R	斜率	截距	Syx	手動均值	ADVIA 120 均值	偏差
0.989	1.18	-19	481	551	628	77

絕對 CSF WBC 分類

CSF WBC 計數的準確性通過將來自 50 份 CSF 患者檢體的手動計數與來自 ADVIA 120 血液分析儀的計數進行比較來評估。下表提供了準確性統計結果。

參數	R	斜率	截距	Syx	手動均值	ADVIA 120 均值	偏差
#MN	0.896	1.07	4	8	9	14	5
#PMN	0.973	1.24	0	11	10	12	2
#NEUT	0.971	1.22	0	11	10	12	2
#LYMPH	0.859	0.88	4	7	10	8	-2
#MONO	0.849	1.69	1	4	1	4	3

CSF WBC 相對百分比

CSF WBC 分類相對百分比的準確性通過將來自 50 份 CSF 患者檢體的手動計數與來自 ADVIA 120 血液分析儀的計數進行比較來評估。按照 CLSI M29-A3 號文件中的建議，通過成對 t 測試和 Rümke 分析對 WBC 分類相對百分比進行分析。下面的結果提供了成對 t 測試的 p 值，以及二項式限制內的結果百分比。

參數	手動均值	ADVIA 120 均值	t 測試 p 值	%在二項式限制內
%MN	72.7	72.2	0.992	100%
%PMN	26.9	25.6	0.800	100%
%NEUT	26.6	22.3	0.383	98%
%LYMPH	63.2	54.6	0.088	96%
%MONO	9.5	17.6	0.15	96%

性能特徵殘留檢體

由於在 CSF 分析中統計的細胞數較低，ADVIA 120 清洗周期旨在消除檢測 CSF 檢體時的殘留檢體。在檢測每份 CSF 檢體之前，ADVIA 120 會沖洗所有試劑以及檢體通道，以便爲下一批檢體作好準備。CSF 檢測的殘留檢體通過測量多次檢測高細胞數檢體，再檢測低細胞數檢體進行評估。觀察到的殘留檢體少於 1%，而殘留檢體表示爲因尾隨低級檢體損失的高級檢體的平均百分比。

性能特徵分析範圍

CSF WBC 和 RBC 計數的分析範圍通過對力低分析值製備的檢體進行一系列稀釋來制定。稀釋研究表明 CSF WBC 計數精確到 5 細胞小 L（在 0-50 細胞小 L 的範圍內），或者精確到 10%（在 50-5,000 細胞小 L 的範圍內）。CSF RBC 計數精確到 5 細胞小 L（在 0 - 50 細胞小 L 的範圍內），或者精確到 10%（在 50-2 880 細胞小 L 的範圍內）。下表提供研究結果。

CSF WBC 低級紛性

池（%的參考水平）	觀察的 WBC	預期的 WBC	絕對偏差	%差
0.00%	0	0	0	
0.05%	2	3	-1	
0.1%	5	5	0	
0.2%	10	10	0	
1.0%	53	50	3	
10.0%	514	501	13	3
100%（參考水平）	5009	5009	0	0

CSF RBC 低級線性

池（%的參考水平）	觀察的 RBC	預期的 RBC	絕對偏差	%差
0.00%	0	0	0	
0.05%	2	1	1	
0.1%	4	3	1	
0.2%	9	6	3	
1.0%	34	29	5	
10.0%	308	288	20	7
100%（參考水平）	2880	2880	0	0

注意：雖然已證明 RBC 線性是 2880 RBC/µL，但仍然應當稀釋 1500 RBC/µL 以上的檢體，以確保白細胞計數的準確性。

WBC DIFF 方法

期望用途

ADVIA 2120/2120i 血液分析儀白細胞分類(WBC DIFF)方法包括過氧化物酶方法和嗜鹼性粒細胞／分葉核方法，用於定量地測量下列血液學參數：

嗜中性粒細胞：WBC 的百分比(%NEUT)和絕對計數(#NEUT)

淋巴細胞：WBC 的百分比(%LYMPH)和絕對計數(# LYMPH)

單核細胞：WBC 的百分比(%MONO)和絕對計數(#MONO)

嗜酸性粒細胞：WBC 的百分比(%EOS 和絕對計數(#EOS)

大型不染色細胞：WBC 的百分比(%LUC)和絕對計數(#LUC)

嗜鹼性粒細胞：WBC 的百分比(%BASO)和絕對計數(#BASO)

過程準則

過氧化物酶方法

過氧化物酶由 Cremins、Kim、Malin 和 Sclafani 根據 Ansley 和 Ornstein 提出的分類細胞染色原則開發。根據這些原則，在對細胞進行細胞化學染色時，淋巴細胞根據細胞特定元素表現出的特徵屬性分類。在多種類型的淋巴細胞中，存在過氧化物酶且較活躍。在使用雙氧水且存在適當的電子受體色原時，過氧化物酶會生成在細胞中沉澱的黑色物質。正常嗜中性粒細胞和嗜酸性粒細胞決定過氧化物酶活動的置信水平，醇活動與細胞成熟度相對應。

已證實單核細胞含有較少數量的過氧化物酶，所以可使用未染色細胞發出的、與染色程度最低的嗜中性粒細胞部分重疊的相對較大光散射信號和吸收信號，將這類細胞定義爲一個細胞種群。

使用過氧化物酶方法分析的淋巴細胞種群含有淋巴細胞和嗜鹼性粒細胞。從淋巴細胞種群中減去嗜鹼性粒細胞計數（通過嗜鹼性粒細胞／分葉核方法獲得），以獲得淋巴細胞計數。

過氧化物酶細胞化學反應包括 2 步。在第一步中，使用 ADVIA 120 PEROX 1 試劑稀釋使用 EDTA 作爲抗凝血劑的全血檢體。表面活性劑和熱應力導致紅血球裂解。ADVIA 120 PEROX 1 試劑中的甲醛使全血細胞固定。

在第二步中，將 ADVIA 120 PEROX 2 試劑和 ADVIA 120 PEROX 3 試劑添加到過氧化物酶反應箱中。ADVIA 120 PEROX 2 試劑中的 4-Chloro-1-naphthol 和 ADVIA 120 PEROX 3 試劑中的雙氧水將嗜中性粒細胞、嗜酸性粒細胞和單核細胞的顆粒中過氧化物酶活動區域染色。淋巴細胞、嗜鹼性粒細胞和大型不染色細胞不包含發生過氧化物酶活動的顆粒。

恆定容量的渲染細胞從 Perox 反應箱進入流通池。兩種液體作爲獨立的通信流流動（不混合），ADVIA 120 PEROX 鞘液流包括檢體流。會測量每種血細胞的吸收和前向光散射特徵。光電二極管將光學信號轉換爲電子脈衝。在進行處理後，訊息會顯示在兩個直方圖中。Perox Y 直方圖包含前向散射數據（細胞大小）。Perox X 直方圖包含吸收數據（過氧化物酶染色）。兩個直方圖共同構成 Perox 直方圖，從中可以標識和統計細胞。

參考書目

Cremins J, et al: Method for the determination of differential white blood cell count. US Patent 4,801,549

Ansley H and Ornstein L: Enzyme histochemistry and differential white cells on the Technicon Hemalog D. In: Advances in Automated Analysis, Technicon International Congress 1970, Volume 1. Therman Associates, Miami, FL, p 437 (1971)

Saunders AM: Hemalog D system - recent development. In: Advances in Automated Analysis, Technicon International Congress 1972, Volume 3. Mediad Inc., Tarrytown, NY, pp 27-32 (1973)

Groner W, et al: Peroxidase activity of human monocytes as a function of pH and fixation observed with the Hemalog D. Presented at ACHE II (2nd workshop of the Automated Cytochemistry and Hematology Exchange), Marlow-on-Thames, England, May 22-23 (1980)

嗜緘性粒細胞／分葉核方法

嗜鹼性粒細胞／分葉核方法由 Cremins 和 Oriik 開發，用於精確統計嗜鹼性粒細胞和測量細胞分葉核。

該方法能夠嚴格、準確且快速地識別嗜鹼性粒細胞。Cremins 和 Orlik 發現，通過結合使用酸和表面活性劑，嗜鹼性粒細胞將具有較高抗裂解性。

在將使用 EDTA 作爲抗凝血劑的全血檢體與 ADVIA 120 BASO 試劑混合時，紅血球會被溶解，細胞質會被從除嗜鹼性粒細胞以外的所有白細胞剝離。然後，會使用激光二極管，通過兩角度激光散射檢測法對檢體進行分析。白細胞分爲三類：嗜鹼性粒細胞、單核(MN)細胞和中性粒細胞(PMN)細胞。

參考書目

Cremins J and Orlik J: Leukocyte differential method. US Patent 5,518,928 (1996)

試劑

需要下列現成的試劑，以執行 DIFF 方法和維護 ADVIA 2120/2120i 血液分析儀。

DIFF TIMEPAC

REF	產品編號	符號	內容	數量(mL)
00739500	T01-3621-52		DIFF TIMEPAC	
-	T01-3630-01	PEROX 1	PEROX 1	2 x 650 mL
-	T01-3631-01	PEROX 2	PEROX 2	2 x 305 mL
-	T01-3632-01	PEROX 3	PEROX 3	2 x 585 mL
-	T01-3633-01	PEROX SHEATH	PEROX 鞘液	2 x 2725 mL

ADVIA 120 BASO

REF	產品編號	符號	內容	數量(mL)
-	T01-3629-01	BASO	BASO	2 x 1100 mL

ADVIA 120 SHEATH/RINSE

REF	產品編號	符號	內容	數量(mL)
02337140	T01-3664-01	SHEATH/RINSE	鞘液／沖洗液	10 L
01554628	T01-3623-01	SHEATH/RINSE	鞘液／沖洗液	20 L

ADVIA 120 PEROX 1

（產品號 T01-3630-01）2 x 650 mL

ADVIA 120 PEROX 1

十二烷基硫酸鈉，0.36 mmol/L

山梨醇，620 mmol/L

氯化鈉，8.35 mmol/L

甲醛，5.7%

BRIJ-35, 0.100 mmol/L

緩衝劑



R20/21/22, R36/37/38, R40, R43
S26, S36/37, S45, S51

有害！

含有甲醛。有可能致癌。吸入、皮膚接觸或吞食均有害。對眼睛、呼吸系統和皮膚均會產生刺激。可能產生不可逆的後果。皮膚接觸可能引起過敏。如果接觸眼睛，請立即使用大量清水沖洗並尋求醫生幫助。佩戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼標籤）。僅在通風良好的區域使用。

用於*試管內*診斷使用。

ADVIA 120 PEROX 2

（產品號 T01-3630-01）2 x 305 mL

ADVIA 120 PEROX 2 包含：

4-Chloro-1-naphthol, 44.8 mmol/L

二甘醇，99.2%

用於*試管內*診斷使用。

ADVIA 120 PEROX 3

（產品號 T01-3630-01）2 x 585 mL

ADVIA 120 PEROX 3 包含：

穩定劑

雙氧水，0.3%

用於*試管內*診斷使用。

ADVIA 120 PEROX SHEATH

（產品號 T01-3630-01）2 x 2725 mL

ADVIA 120 PEROX SHEATH 包含：

丙二醇，4.06 mol/L

表面活性劑

用於*試管內*診斷使用。

PEROX 鞘液運可單獨供應。

REF	產品編號	符號	內容	數量(mL)
03624240	T01-3633-54	PEROX SHEATH	PEROX 鞘液	4 x 2725 mL

存儲與穩定性

試劑

存儲在 15℃至 30℃的環境下：

- 未開封試劑在產品標籤上印刷的有效期內是穩定的。
- 已開封 ADVIA 120 BASO、ADVIA 120 PEROX 1、ADVIA 120 PEROX 2、ADVIA 120 PEROX 3 和 ADVIA 120 PEROX 鞘液試劑可在 90 天內保持穩定。

校正品和品管品

避免產品冷凍。

存儲在 2℃至 8℃環境時，除非另有說明，否則未開封 ADVIA OPTIpoint（產品號 T03-3682-01）、ADVIA SETpoint 校正品(PN T03-3685-01)和 ADVIA TESTpoint 血液品管品（分別爲 PN T03-3686-01，低；T03-3687-01，正常；T03-3688-01，高）在產品標籤上印刷月份的最後一天之前都保持穩定。

在開封後，如使用原容器在 2℃至 8℃的環境下密封存儲，ADVIA OPTIPoint 在 7 天內穩定，ADVIA TESTpoint 血液品管品在 10 天內穩定，ADVIA SETpoint 校正品在 5 天內穩定。

增益調整

增益調整過程用於調整頻道中信號的放大率，以有效確定直方圖中細胞信號的位置。

校正

必須針對除%Retics 以外的所有參數對分析儀進行校正。Siemens 建議使用 ADVIA SETpoint 校正品（產品號 T03-3685-01）。有關產品說明，請參考第 5 頁。

在下列情況下應執行校正過程：

- 在安裝分析儀時。
- 在更換關鍵硬件組件或試劑批號後，如果檢查增益以後品管品值發生明顯改變。
- 品管品結果和／或移動均值超出範圍，而且已證實該情況與分析儀有關。

檢體處理

檢體收集

使用包含 EDTA 作爲抗凝血劑的採血管收集全血。如果不能在採集後的 8 小時內分析血液檢體，請將其在 2℃至 8℃的環境下冷藏。如果已將檢體冷藏，在分析前，使該檢體升溫到室溫（15℃至 30℃）。檢體稀釋

參數值超出分析範圍的全血檢體可使用自體血漿或等滲鹽水進行稀釋並重新檢測。

檢體穩定性

使用 ADVIA 120 血液分析儀對血液老化的影響進行 72 小時以上的研究。從 15 位正常、明顯健康的捐贈人獲得的兩份全血檢體在採集後立即進行檢測，然後按照 8、24、36、48、56 和 72 小時的間隔進行檢測。將來自每一組的全新檢體之一存儲在室溫下，而對照檢體在 2℃至 8℃下存儲在包含 EDTA 作爲抗凝血劑的密封採血管中。

結果說明 WBC DIFF 參數穩定在按指定時間間隔進行初次獲得的二(2)個標準差（在運行精度內）內。

參數	室溫穩定性（小時）	冷藏溫度穩定性（小時）
%NEUT	36	72
%LYMPH	36	72
%MONO	72	72
%EOS	8	72
%BASO	72	56
%LUC	72	72

未提供所需材料

對於 ADVIA 2120/2120i 血液分析儀，執行 ADVIA 120 WBC DIFF 方法需要的其他材料包括不同的品管品材料、校正品、ADVIA OPTIpoint 以及”方法說明”一節中指定的其他試劑或設備。

過程

要通過 ADVIA 2120/2120i 血掖分析儀分析檢體，請參考”日常程序”。

品質管制

建議使用 ADVIA TESTpoint 血液品管品來控制分析儀。有關產品說明，請參考第 5 頁。這些品管品用於與臨床實驗室自身的品質管制計劃和過程相結合。

在下列情況下應對品管品材料進行檢測：

- 每個班次開始時或實驗室選擇的其他時間間隔。
- 試劑批號更改後。
- 更換分析模組中可能影響分析性能的任何零部件之後。

實驗室可以選擇定期測試保留的患者檢體，以監測性能趨勢。

結果

本分析儀會自動執行爲獲得最終結果所需的全部計算。

通過使用複雜標記算法，實驗室工作人員會對可疑異常狀況保持警覺。相應的標記指示這些狀況（如＊、十和／或用顏色突出顯示）。只要出現一個標記，用戶就應該檢查結果並執行適當的措施。

過程限制

過程限制如下所示：

1. 某些異常檢體，如進行血液透析患者的檢體，包含有核紅血球的患者檢體（特別是新生兒）以及血小板凝集或紅血球不完全裂解的檢體，可能會干擾白細胞分類。
2. 流動的小巨核細胞可能會被統計爲白細胞。
3. 在檢體中，可能會觀察到過氧化物酶通道中的紅血球不完全裂解，且尿素氮水平上升(BUN > 75 mg/dL)。
4. 再從遺傳性和獲得性過氧物醇缺陷症患者得到的檢體中，可能會觀察到對過氧化物酶通道性能的干擾。已在約 0.5%的實驗室檢體中觀察到上述缺陷。
5. 在某些異常檢體（特別是淋巴增生和白血病）中，可能會觀察到嗜鹼性粒細胞計數虛高。

期望值

期望值的範圍因年齡、性別、飲食、地區等因素而異。建議每間實驗室指定自己的一組期望值範圍。

下列期望值範圍基於對假設健康的成年人群體的 60 份全血檢體的重複檢測。

參數	低值	高值
%NEUT	40	77
%LYMPH	16	44
%MONO	4	9
%EOS	1	7
%BASO	0	1
%LUC	1	4

注意：由於對數值進行捨入，Diff 結果應為總數 100% ± 0.2%，除非%BASO 為> 5%且觸發 Baso Count Suspect (B-SUSP, BC)標誌。在總數大於 100% ± 0.2%時，會由於%BASO 而導致數量超過 100%。

性能特徵不精確性

使用多個檢體執行共 18 次測試。

下列不精確性估計值是通過對每個全血檢體進行 25 次吸取獲得的。每種檢體選擇模式均通過從開放管採樣進行測試，並使用手動和自動的密封管進樣器。

參數	均值	標準差	CV (%)
%NEUT	55.0	0.9	1.6
%LYMPH	31.3	0.9	2.9
%MONO	7.2	0.5	6.9
%EOS	3.4	0.3	8.8
%BASO	0.5	0.1	20.0
%LUC	2.5	0.4	16.0

性能特徵相關數據

ADVIA 120 血液分析儀的性能與 Technicon H•3 RTC 分析儀(x)進行比較，期間使用來自 60 個正常捐贈者和 70 個醫院捐贈者的全血，且每個檢體均重複檢測(n = 260)。

下列回歸統計量使用與 NCCLS EP9-A 號文件，《*Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline (1995)*》 中所推薦協議相似的協議進行計算。

參數	比較用分析儀或方法	回歸等式(y =)	r	Sy.x
%NEUT	Technicon H 3 RTC	1.02x - 0.6	0.997	1.6
%LYMPH	Technicon H 3 RTC	1.00x + 0.8	0.997	1.7
%MONO	Technicon H 3 RTC	0.85x - 0.3	0.943	0.8
%EOS	Technicon H 3 RTC	0.87x + 0.2	0.979	0.4
%BASO	Technicon H 3 RTC	0.67x + 0.0	0.772	0.2
%LUC	Technicon H 3 RTC	0.92x + 0.6	0.944	0.7

x = Technicon H 3 RTC 分析儀

y = ADVIA 120 血液分析儀

網狀紅血球方法

期望用途

ADVIA 2120/2120i 血液分析儀全血細胞計數(RETIC)方法用於定量地測量下列血液學參數：

- 網狀紅血球濃度(#RETIC)
- 網狀紅血球百分比(%RETIC)
- 網狀紅血球比色計內容(CHr)

過程準則

網狀紅血球計數

過去，通過手動方法使用顯微鏡檢測網狀紅血球，同時使用新亞甲藍和燦爛甲酚藍等核酸染色劑。該方法使用核酸染色劑(oxazine 750)對細胞的 RNA 進行染色。

兩微升(2 µL)使用 EDTA 作爲抗凝血劑的全血檢體與 ADVIA 120 autoRETIC 試劑混合。ADVIA 120 autoRETIC 試劑等容地包圍紅血球，並將細胞的 RNA 染色。會統計並測量所有細胞的小角度激光散射、大角度激光散射以及吸收特徵。吸收數據用於根據每個細胞的 RNA 含量，將其分爲網狀紅血球或成熟的紅血球。

網狀紅血球大小

確定紅血球大小的方法爲使用在 2 個不同角度間隔散射激光的同時測量，這能夠消除細胞血紅素濃度的變化對確定細胞體積的不利影響。

CHr

CHr 是網狀紅血球種群的血紅素細胞含量(CH)直方圖的均值。

CHr 已證明是功能性缺鐵的早期跡像。在治療與確期腎衰和其他疾病有關的貧血時，如果使用紅血球生成素(rHuEPO)，可能出現功能性缺鐵症狀。檢測缺鐵性貧血的情統方法已證實無法高效、明確地診斷出功能性缺鐵。通過提供對網狀紅血球中血紅素含量的直接測量，CHr 檢測爲醫師提供了一種全新的有效工具，用於早期診斷功能性缺鐵，並提供可用於管理 rHuEPO 治療中的鐵需求的其他訊息。

參考書目

Savage RA, Skoog DD, and Rabinovich A: Analytical inaccuracy and imprecision in reticulocyte counting: A preliminary report from the College of American Pathologist' s reticulocyte project. *Blood Cells* **11**: 7-112 (1985)

Brugnara C, Colella G, Cremins J, Langley R, Schneider T, Rutherford C, Goldberg M.: Effects of subcutaneous recombinant human erythropoietin in normal subjects: Development of decreased reticulocyte hemoglobin content and iron-deficient erythropoiesis. *J Lab Clin Med* **123**: 60-667 (1994)

Fishbane S, et al: Reticulocyte hemoglobin content in the evaluation of iron status in hemodialysis patients. *Kidney Intl* **52**: 17-222 (1997)

試劑

需要下列現成的試劑，以執行網狀紅血球方法和維護 ADVIA 2120/2120i 血液分析儀。

ADVIA 120 autoRETIC

ADVIA 120 SHEATH/RINSE

ADVIA 120 EZ KLEEN

ADVIA 120 DEFOAMER

ADVIA 120 autoRETIC

REF	產品編號	符號	內容	數量(mL)
04296794	T01-3622 - 54	EZ KLEEN	autoRETIC	4 x 820 mL
-	T01-3622 - 01	EZ KLEEN	autoRETIC	820 mL

ADVIA 120 autoRETIC 包含：

Oxazine 750, 11.4 mg/L

緩衝劑

N-Tetradecyl-N, N-dimethyl-3-ammonio-1-propane sulfonate, 0.023 mmol/L

N, N-dimethylformamide, 0.38%

用於*試管內*診斷使用。

ADVIA 120 EZ KLEEN

REF	產品編號	符號	內容	數量(mL)
05101601	T01-3624-54		EZ KLEEN	4 x 810 mL
-	T01-3624-01		EZ KLEEN	810 mL

公式中包含：

氯化鈉，50 mmol/L

2-(2-Ethoxyethoxy)ethanol, 894 mmol/L

表面活性劑

用於*試管內*診斷使用。

有關鞘液／沖洗液的產品說明，請參考第 23 頁。有關去沫劑的產品說明，請參考第 22 頁。

存儲與穩定性

試劑

存儲在 15℃至 30℃的環境下：

- 未開封試劑在產品標籤上印刷的有效期內是穩定的。
- ADVIA 120 autoRETIC 試劑的開封容器可在 120 天內保持穩定。
- ADVIA 120 鞘液／沖洗液的開封容器可在 45 天內保持穩定。
- ADVIA 120 EZ KLEEN 和去沫劑可在 90 天內保持穩定。

校正品和品管品

ADVIA 120 RETIC 品管品高

REF	產品編號	符號	內容	數量(mL)
09091295	T03-3691-54	CONTROL RETIC HIGH	網狀紅血球品管品高	4 x 4.0 mL
-	T03-3691-01	CONTROL RETIC HIGH	血液品管品高	4.0 mL

ADVIA 120 RETIC 品管品高

REF	產品編號	符號	內容	數量(mL)
08773805	T03-3690-54	CONTROL RETIC LOW	網狀紅血球品管品低	4 x 4.0 mL
-	T03-3690-01	CONTROL RETIC LOW	血液品管品低	4.0 mL

避免產品冷凍。

存儲在 2℃至 8℃環境時，除非另有說明，否則未開封 ADVIA OPTIpoint（產品號 T03-3682-01）、ADVIA SETpoint 校正品（產品號 T03-3655-01）和 ADVIA TESTpoint 血液品管品（分別爲產品號 T03-3690-01，低；T03-3691-01，高）在產品標籤上印刷月份的最後一天（有效期）之前都保持穩定。

在開封後，如使用原容器在 2℃至 8℃的環境下密封存儲，ADVIA OPTIPoint 在 7 天內穩定，ADVIA TESTpoint 血液品管品在 10 天內穩定，ADVIA SETpoint 校正品在 5 天內穩定。

增益調整

增益調整過程用於調整頻道中信號的放大率，以有效確定直方圖中細胞信號的位置。

校正

必須針對除%Retics 以外的所有參數對分析儀進行校正。正確設置 RETIC 增益因子可保證大多數實驗室的%RETIC 結果足夠精確。在過種情況下，不要更改出廠時設置的%RETIC 校正因子 1.00。

不過，對於使用 NCCLS 或 ICSH 建議方法以外的手動計數方法的實驗室，或者使用某些流量分析方法的實驗室，在與 ADVIA 2120/2120i 血液分析儀方法比較時會觀察到明顯偏差。在過種情況下，使用校正過程來保證與其他方法一致。

在下列情況下應執行校正過程：

- 在安裝分析儀時。
- 在更換關鍵硬件組件或試劑批號後，如果檢查增益以後品管品值發生明顯改變。
- 品管品結果和／或移動均值超出範圍，而且已證實該情況與分析儀有關。

檢體處理

檢體收集

使用包含 EDTA 作爲抗凝血劑的採血管收集全血。如果不能在採集後的 8 小時內分析血液檢體，請將其在 2℃至 8℃的環境下冷藏。如果已將檢體冷藏，在混合前，使該檢體升溫到室溫（15℃至 30℃）。

檢體稀釋

在分析 RETIC 時建議不要稀釋全血檢體。

檢體穩定性

使用 ADVIA 1 20 血液分析儀對血液老化的影響進行 72 小時以上的研究。從 15 位正常、明顯健康的捐贈人獲得的兩份全血檢體在採集後立即進行檢測，然後按照 8、24、36、48、56 和 72 小時的間隔進行檢測。將來自每一組的全新檢體之一存儲在室溫下，而對照檢體在 2℃至 8℃下存儲在包含 EDTA 作爲抗凝血劑的密封採血管中。

結果說明 RETIC DIFF 參數穩定在按指定時間間隔進行初次獲得的二(2)個標準差（在運行精度內）內。計算參數的穩定性取決於最不穩定的主要參數的穩定性。

參數	室溫穩定性（小時）	冷藏溫度穩定性（小時）
%RETIC	24	72
CHr	24	72

未提供所需材料

對於 ADVIA 2120/2120i 血液分析儀，執行 ADVIA 120 網狀紅血球方法需要的其他材料包括不同的品管品材料、校正品、ADVIA OPTIpoint 以及”方法說明”一節中指定的其他試劑或設備。

過程

要通過 ADVIA 2120/2120i 血液分析儀分析檢體，請參考”日常程序”。

品質管制

建議使用 ADVIA TESTpoint 血液品管品來控制分析儀。這些品管品用於與臨床實驗室自身的品質管制計劃和過程相結合。

在下列情況下應對品管品材料進行檢測：

- 每個班次開始時或實驗室選擇的其他時間間隔。
- 試劑批號更改後。
- 更換分析模組中可能影響分析性能的任何零部件之後。

實驗室可以選擇定期測試保留的患者檢體，以監測性能趨勢。

結果

本分析儀會自動執行爲獲得最終結果所需的全部計算。

通過使用複雜標記算法，實驗室工作人員會對可疑異常狀況保持警覺。相應的標記指示這些狀況（如＊、十和／或用顏色突出顯示）。只要出現一個標記，用戶就應該檢查結果並執行適當的措施。

過程限制

過程限制如下所示：

1. 在檢測計數極高的檢體時，網狀紅血球方法可能給出與 NCCLS 手動計數相差較大的網狀紅血球計數。一般，含有鐮狀細胞或有核紅血球的檢體的計數會極高。
2. 含有下列細胞類型或存在下列情況的患者檢體可能會干擾 ADVIA 120 網狀紅血球方法：

 瘧原蟲

 含鐵小體

 染色質小體

 海因茲小體

 包括上升爲嗜鹼性斑點

 巨大血小板（巨大血小板）

 巨幼紅血球性貧血

 其他少見的、特徵不明顯的異常紅血球

期望值

期望值的範圍因年齡、性別、飲食、地區等因素而異。建議每間實驗室指定自已的一組期望值範圍。

下列期望值範圍基於對假設健康的成年人群體的 60 份全血檢體的重複檢測。

參數	低值	高值
#RETIC(109/L)	40	79
%RETIC	0.8	2.1
CHr(pg)	24	36

性能特徵不精確性

使用多個檢體執行共 18 次測試。

下列不精確性估計值是通過對每個全血檢體進行 25 次吸取獲得的。每種檢體選擇模式均通過從開放管採樣進行測試，並使用手動和自動的密封管進樣器。

參數	均值	標準差	CV (%)
#RETIC (10^9/L)	57.8	7.7	13.3
%RETIC	1.2	0.16	13.3
CHr (pg)	28.9	0.2	0.7

性能特徵相關數據

ADVIA 120 血液分析儀的性能與 Technicon H•3 RTC 分析儀(x)進行比較，期間使用來自 60 個正常捐贈者和 70 個醫院捐贈者的全血，且每個檢體均重複檢測(n = 260)。

下列回歸統計量使用與 NCCLS EP9-A 號文件，《*Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline (1995)*》中所推薦協議相似的協議進行計算。

參數	比較用分析儀或方法	回歸等式(y =)	r	Sy.x
#RETIC (10^9/L)	Technicon H•3 TC	0.79x + 7.8	0.903	13.6
%RETIC	Technicon H•3 TC	0.82x + 0.2	0.925	0.4
CHr (pg)	Technicon H•3 TC	0.96x + 4.2	0.940	1.7

x = Technicon H•3 RTC 分析儀

y = ADVIA 120 血掖分析儀

性能特徵殘留檢體

ADVIA 2120/2120i 血液分析儀的殘留檢體表示爲因尾隨低級檢體損失的高級檢體的平均百分比。RBC 計數確定的殘留檢體來自網狀紅血球通道(RTC RBC)。

參數	觀察到的殘留檢體
RTC RBC	1.0%

性能特徵分析範圍

%RETIC 參數的分析範圍爲：

參數	評估範圍	觀察到的最大偏差
%RETIC	0.2 – 24.9	2.6

方法數據摘要

CBC 方法數據

下表中列出了 CBC 方法的檢體穩定性、預期範圍和性能特徵。

	檢體穩定性		預期	不精確性			相關數據			觀察值	分析範圍	
	室溫	已冷藏	值	均值	SD	CV%	y=	r	Sy.x	殘留檢體	範圍	偏差
WBC ($10^3/\mu L$)	**36h**	**56h**	**3.8 至 8.6**	**5.91**	**0.16**	**2.7**	**1.06x - 0.74**	**0.997**	**1.42**	**0.4%**	**0.02 至 21.83**	**$0.46x10^3/\mu L$**
											20.48 至 409.55	**4.1%**
RBC ($10^6/\mu L$)	**48h**	**72h**	**4.1 至 6.0**	**4.82**	**0.05**	**1.0**	**0.98x + 0.11**	**0.997**	**0.07**	**0.2%**	**0.0 至 2.65**	**$0.03 x 10^6/\mu L$**
											2.65 至 6.76	**1.1%**
HGB (g/dL)	**72h**	**72h**	**10 至 16**	**13.3**	**0.11**	**0.8**	**1.01x - 0.2**	**0.997**	**0.2**	**0.2%**	**0.0 至 8.6**	**0.2 g/dL**
											8.6 至 22.5	**2.5%**
MCV (fL)	**8h**	**24h**	**76 至 100**	**81.0**	**0.3**	**0.4**	**0.90x + 9.6**	**0.994**	**1.1**	★	★	★
CH (pg)	**36h**	**53h**	**24 至 35**	**26.5**	**0.05**	**0.2**	**1.00x + 1.2**	**0.990**	**0.6**	★	★	★
CHCM (g/dL)	**8h**	**24h**	**29 至 34**	**30.6**	**0.14**	**0.5**	**1.17x - 6.5**	**0.974**	**0.5**	★	★	★
RDW (%)	**72h**	**72h**	**12 至 15**	**12.3**	**0.07**	**0.6**	**0.86x + 1.3**	**0.980**	**0.6**	★	★	★
HDW (g/dL)	**72h**	**72h**	**1.9 至 3.0**	**2.56**	**0.02**	**0.8**	**0.98x + 0.06**	**0.959**	**0.13**	★	★	★
PLT ($10^3/\mu L$)	**48h**	**48h**	**140 至 360**	**256**	**6.9**	**2.7**	**1.08x - 2.0**	**0.991**	**27**	**0.1%**	**5 至 208**	**$10 x 10^3/\mu L$**
											205 至 3983	**4.9%**
MPV (fL)	**8h**	**8h**	**7 至 9**	**8.1**	**0.11**	**1.4**	**0.76x + 0.9**	**0.925**	**0.4**	★	★	★
HCT (%)	★	★	**33 至 57**	★	★	★	★	★	**n/a**	★	★	★
MCH (pg)	**n/a**	**n/a**	**24 至 31**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	★	★	★
MCHC (g/dL)	★	★	**28 至 34**	★	★	★	**n/a**	**n/a**	**n/a**	★	★	★

★不可用或不適用於該參數

x = Technicon H•3 RTC 分析儀 y = ADVIA 120 血液分析儀

WBC DIFF 方法數據

下表中列出了 WBC DIFF 方法的檢體穩定性、預期範圍和性能特徵。

	檢體穩定性		預期	不精確性			相關數據		
	室溫	已冷藏	值	均值	SD	CV%	y=	r	Sy.x
%NEUT	**36h**	**72h**	**40 至 77**	**55.0**	**0.9**	**1.6**	**1.02x - 0.6**	**0.997**	**1.6**
%LYMPH	**36h**	**72h**	**16 至 44**	**31.3**	**0.9**	**2.9**	**1.00x + 0.8**	**0.997**	**1.7**
%MONO	**72h**	**72h**	**4 至 9**	**7.2**	**0.5**	**6.9**	**0.85x - 0.3**	**0.943**	**0.8**
%EOS	**8h**	**72h**	**1 至 7**	**3.4**	**0.3**	**8.8**	**0.87x + 0.2**	**0.979**	**0.4**
%BASO	**72h**	**56h**	**0 至 1**	**0.5**	**0.1**	**20.0**	**0.67x + 0.0**	**0.772**	**0.2**
%LUC	**72h**	**72h**	**1 至 4**	**2.5**	**0.4**	**16.0**	**0.92x + 0.6**	**0.994**	**0.7**

RETIC 方法數據

下表中列出了 RETIC 方法的檢體穩定性、預期範圍和性能特徵。

	檢體穩定性		預期	不精確性			相關數據			觀察值	分析範圍	
	室溫	已冷藏	值	均值	SD	CV%	y=	r	Sy.x	殘留檢體	範圍	偏差
#RETIC	**24h**	**72h**	**0.8 至 2.1**	**1.2**	**0.16**	**13.3**	**0.82x + 0.2**	**0.925**	**0.4**	★	**0.2 至 24.9**	**2.6**
#RETIC($10^6/\mu L$)	★	★	**40 至 79**	**57.8**	**7.7**	**13.3**	**0.79x + 7.8**	**0.903**	**13.6**	★	★	★
CHr (g/dL)	**24h**	**72h**	**24 至 36**	**28.9**	**0.2**	**0.7**	**0.96x + 4.2**	**0.940**	**1.7**	★	★	★
RTC RBC 計數	★	★	★	★	★	★	★	★	★	**1.0%**	★	★

★不可用或不適用於該參數

ADVIA Autoslide®製片染片機

概述 3

玻片分配器 4
破碎玻片托盤 4
前檢修門 4
染色劑溢流回收盤 4
染片機檢修門 5
風扇 5
主電源開關和電源連接 5
流控與傳感器連接 6
ADVIA AUTOSLIDE 製片染片機特定符號： 6

AUTOSUDE 安全訊息與警告 7

操作原理 9

AUTOSLIDE 日常程序 11

AUTOSLIDE 操作 11

裝載試劑 11
裝載玻片架 12
裝載玻片 12
清空染色劑廢液容器 13
手動運行日常啓動過程 13
手工命令執行推片 14
對手動塗片的玻片進行染色 14
重新設置 AUTOSLIDE 模組 15
停止 AUTOSLIDE 模組（FASTS STOP（快停）） 15
手動運行日常關機過程 15
斷開 AUTOSLIDE 90°配置 16
AUTOSLIDE 染色法 19
MAY-GRÜNWALD GIEMSA 染色法 19
預計用途 19
總結與說明 20
染色方案 20
過程原則 21
紅血球僞影的成因 22
試劑和耗材 22
染色劑 1 - May-Grünwald 染色劑 23
染色劑 2 - Giemsa 染色劑 23
May - Grünwald 緩衝劑 23
甲醇 24
試劑的存儲與穩定性 24
未提供的所需材料 24
限制 24
結果 24
技術支持 24
參考書目 25
改進的 WRIGHT 染色法 25
預計用途 25

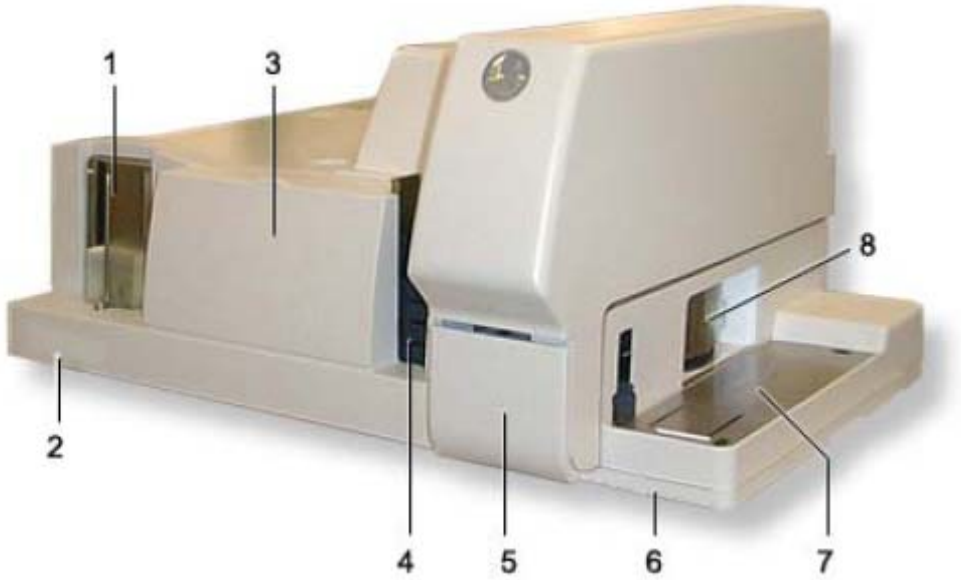
總結與說明 25
染色方案 25
過程原則 26
紅血球僞影的成因 27
試劑和耗材 27
改進型 Wright 染色劑 28
改進型 Wright 緩衝劑 28
甲醇 28
試劑的存儲與穩定性 29
未提供的所需材料 29
限制 29
結果 29
技術支持 29
參考書目 29
WRIGHT GIEMSA 染色法 30
預計用途 30
總結與說明 30
染色方案 30
過程原則 31
紅血球僞影的成因 32
試劑和耗材 32
Wright Giemsa 染色劑 33
Wright Giemsa 緩衝劑 33
甲醇 33
試劑的存儲與穩定性 33
未提供的所需材料 34
限制 34
結果 34
技術支持 34
參考書目 34
定期維護 34
清除玻璃碎屑廢棄物 35
清洗染色劑溢流盤 37
執行每周關機和啓動 38
清洗染片機的染色池和托盤 38
清洗風扇過濾器 41
更換塗片帶並清潔推片楔 41
更換印表機色帶 43
更換 AUTOSLIDE 保險絲 44
錯誤消息與建議操作 44
AUTOSLIDE 規格 49

概述

ADVIA® AutoSlide 製片染片機是一個選配組件，它連接到 ADVIA 2120/2120i 血液分析儀，並由 ADVIA 2120/2120i 系統軟體控制。它可以在顯微鏡玻片上自動製備優質血塗片並爲其染色，以進行白細胞(WBC)分類分析和顯微鏡檢查。可以在系統軟體中自定義標準，系統基於這些標準製片並染色。還可以選擇全部製片或不製作任何玻片，也可以選擇只製備玻片而不進行染色。

重要訊息

系統僅爲在自動進樣器模式下吸取的檢體製作玻片。



1 玻片分配器

2 破碎玻片托盤

3 前檢修門

4 裝架器

5 手動／急診進氣門

6 染色劑溢流回收盤

7 架收集區

8 染片機檢修門

玻片分配器



警告

不要試圖清空玻片分配器！如果將玻片從玻片分配器裝置中取出，可能會割傷手指。避免與玻片分配器機械裝置進行任何不必要的接觸。必須使用工具打開玻片分配器的蓋板。不要關閉傳感器。

破碎玻片托盤



警告 

生物危害

破碎玻片等所有鋒利物品均應視為具有生物危害，並應當將其棄置在適當容器中。為避免人身傷害，要小心處理破碎的玻片。佩戴個人防護設備。操作時要極為小心。如需全面的生物危害說明，請參考”Autoslide 安全訊息與警告”一節。

前檢修門



警告 

生物危害

為避免操作者受傷，ADVIA Autoslide 製片染片機上的檢修門裝備有傳感器，在打開門時會停止 Autoslide 操作。

佩戴個人防護設備。操作時要極為小心。如需全面的生物危害說明，請參考”Autoslide 安全訊息警告”一節。

在 Autoslide 操作過程中，前檢修門打開時儀器的製片機組件停止操作，而玻片的移動和染色操作會繼矮進行。

染色劑溢流回收盤



警告

染色試劑含有易燃、有害的物質甲醇。如需全面的生物危害說明，請參考”Autoslide 安全訊息警告”一節。

為避免人身傷害和損壞儀器，必須定期檢查試劑溢流盤，確試無試劑泄漏。

如果托盤中有液體，請關閉分析儀，採取必要安全防護措施後將液體傾倒入廢液容器，並致電當地的技術服務提供商或代理商。

不要更換軟管。請聯繫您當地的技術服務提供商或代理商進行更換。

染片機檢修門

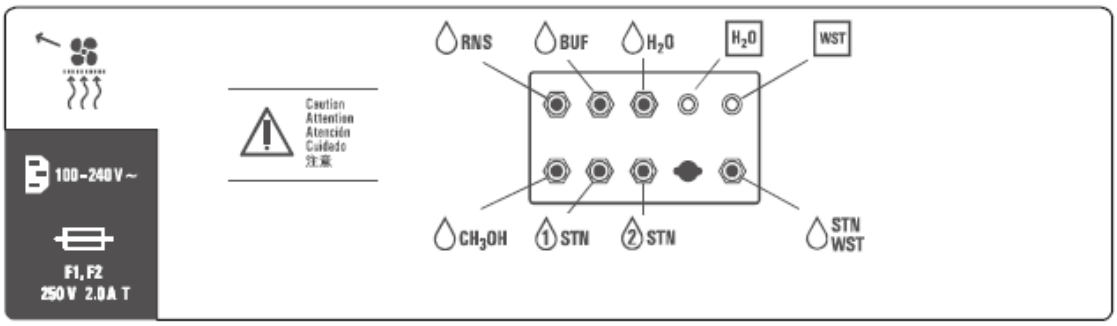
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在 Autoslide 操作過程中，染片機檢修門打開時所有 Autoslide 操作都會停止。

Autoslide 後面板



按鍵：

RNS	BUF	H_2O	H_2O	WST
沖洗劑	緩衝劑	水	水傳感器	染色劑廢液傳感器
CH_3OH	1 STN	2 STN		STN WST
甲醇	染色劑 1	染色劑 2		染色劑廢液

風扇

警示

不要遮擋風扇

主電源開關和電源連接

警示

電源開關和輸入電源插座應始終放在便於檢修的位置。在擺放分析儀供操作使用時，要留出所需空間，以便於對這些部件進行檢修。

ADVIA Autoslide 製片染片機的安裝、連接和斷開必須僅由授權人員執行。

要求主電源必須接地。檢查接地牆面插頭是否與實驗室接地系統正確連接。如果無接地系統，則需要使用接地棒。

只使用隨分析儀提供的主電源線，或有相同特性的電線：

- 歐洲電線類型：HO5W-F
- 美國電線類型：SVT、AWG 18-3

主電源的電壓波動不能超過正常電壓的 ± 10%。

流控與傳感器連接



生物危害

佩戴個人防護設備操作時要極為小心。如需全面的生物危害說明，請參考”Autoslide 安全訊息與警告”一節。



甲醇的安全性

如需全面的甲醇安全性說明，請參考”*Autoslide 安全訊息與警告*”一節。

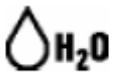
ADVIA Autoslide 製片染片機特定符號：



沖洗劑



緩衝劑



水



水傳感器



染色劑廢液傳感器



甲醇



染色劑 1



染色劑 2



染色劑廢液



主電源連接



不要遮擋風扇



玻璃碎屑托盤



玻片放置指向

Autoslide 安全訊息與警告

重要訊息

ADVIA Autoslide 製片染片機的安裝、連接和斷開必須僅由授權人員執行。

移動分析儀前，請聯繫您當地的服務提供商或代理商以獲得必需訊息。

使用儀器附帶的提手提起或移動儀器。

裝運分析儀前，無論要將其運往何處，都必須進行外部污染排除。

運輸、廢棄或暫時停用分析儀前，必須進行徹底清潔。

Autoslide 的存儲和運輸溫度必須在-20℃至+50℃之間。



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，操作者應按照美國臨床實驗室標準化委員會(NCCLS) M29-A號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。



電氣警告

為避免在執行某一過程時受到電擊或損壞儀器，請在繼續操作之前關閉分析儀的電源。

用戶不得處理或檢查以下部件：

- ***電源***
- ***電子線路板***

電擊可能會導致操作者受傷。電子部件可能會導致用戶受到電擊並受傷。除非此文檔中有說明，否則不要改動儀器，也不要將任何組件的蓋板、門、面板等取下。



警告

不要關閉傳感器。否則可能導致操作者受傷。在分析儀操作期間，不要打開 Autoslide 的門或蓋板。否則會導致分析儀停止操作並取消所有正在運行的玻片。



警告

不要關閉傳感器。否則可能導致操作者受傷。在分析儀操作期間，不要打開 Autoslide 的門或蓋板。否則會導致分析儀停止操作並取消所有正在運行的玻片。



甲醇的安全性

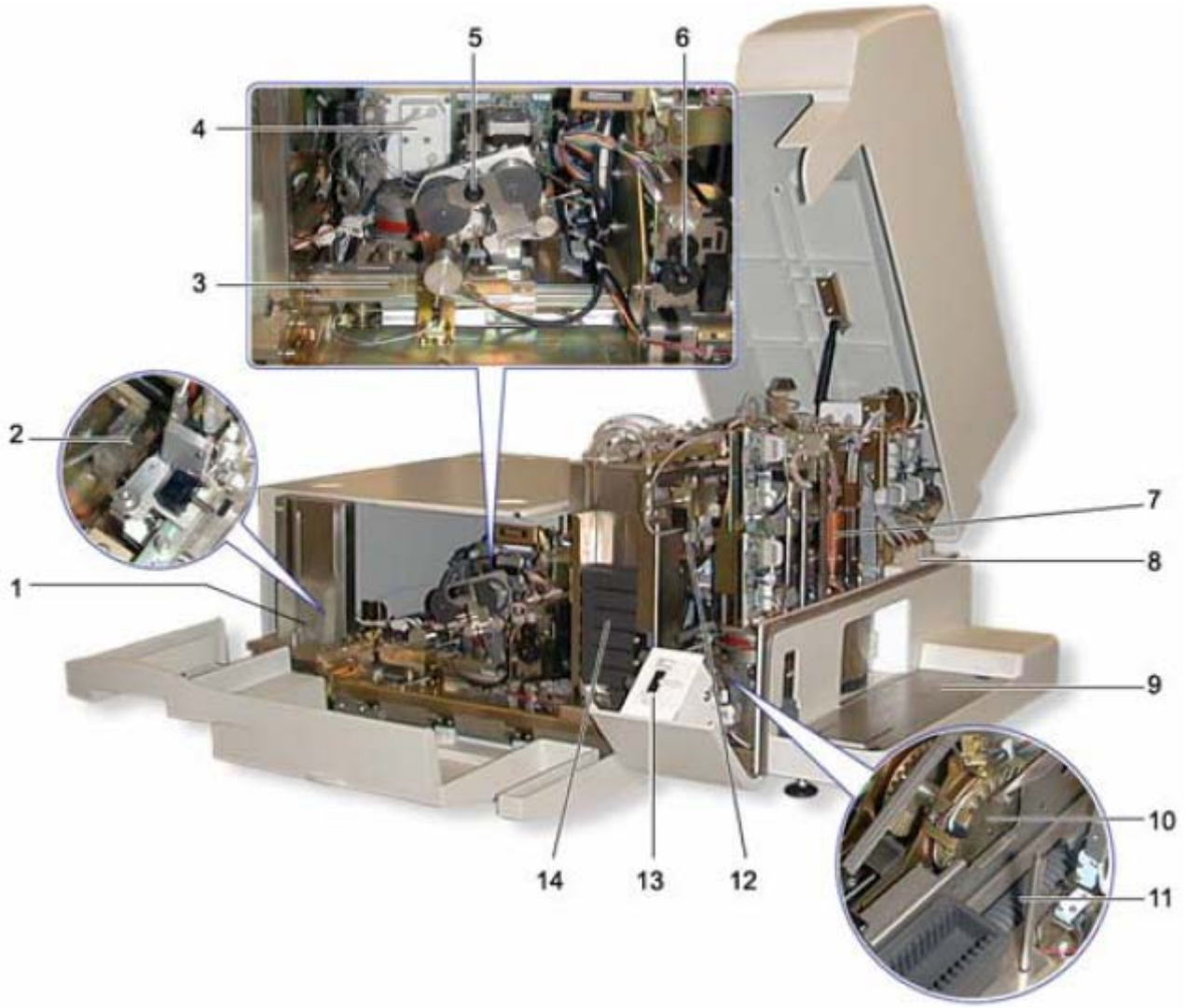


有毒！有毒：吸入、皮膚接觸或吞食都會導致十分嚴重的不可逆危險後果。注意蓋好容器。避免接觸皮膚。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼標籤）。



高度易燃！高度易燃。遠離火源。禁止吸烟

操作原理



1 玻片分配器

2 滴注針

3 玻片載體

4 採樣注射器

5 塗片器

6 印表機

7 染片機裝置

8 試劑注射器

9 架輸出隊列

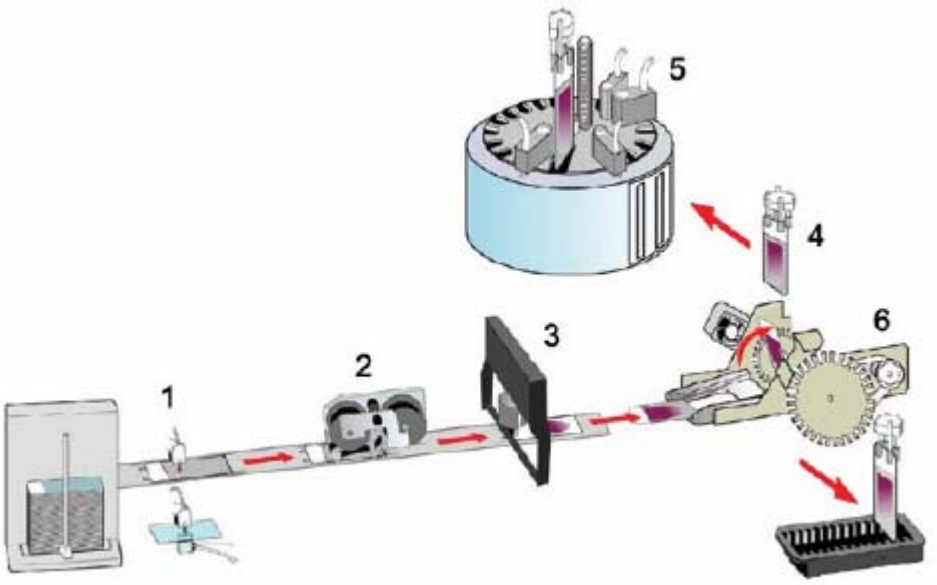
10 豎直器

11 傳輸架裝置

12 玻片傳輸及抓取裝置

13 手動進氣口

14 裝架器



1. 滴注針滴出 1 滴檢體到玻片上。然後將其余檢體滴入滴注針沖洗設備，用沖洗液沖洗。

2. 楔形塗片裝置和塗片色帶利用血液的表面張力製作塗片。在與血液接觸前，楔形塗片被放置在玻片上，等待血液沿其移動。用戶可以調整等待時間、液滴大小、塗片速度以及楔形塗片角度。

 之後，系統將玻片拉回，製作塗片。

 塗片過程結束後，系統會沖洗塗片失並移動塗片帶，備好乾淨的部分供下一個玻片使用。

3. 玻片則進入印表機，將患者基本訊息或其他訊息直接列印在其上。

4. 列印後，玻片移動到堅直器中，堅直器會按要求將其傳輸到染色筒中或直接傳輸到架上。

5. 如需染色，玻片移動到染片機中，染片機是一個包含 32 個染色筒的旋轉式托盤。有一個針板承托著針頭（針位置可調），用於將液體滴入染色筒中，或從筒中吸取液體。根據使用的染色法，對玻片進行染色。

6. 染色完成後，玻片被轉移到架中，完成處理。

Autoslide 日常程序

1. 檢查染色劑廢液容器中液體的液面。必要時清空容器。
2. 檢查 Autoslide 試劑的液面和有效期。必要時加入試劑。要記住對所有新換試劑的試劑管進行灌注。如果系統使用水，檢查水平面。
3. 裝載玻片和架。
4. 檢查塗片帶狀態並在必要時進行更換。
5. 如果系統未設置爲自動執行日常啓動周期，手動執行日常啓動過程。
6. 運行檢體。系統會根據軟體設置自動準備玻片。無論結果如何，都還可以請求製作檢體玻片，或者使用 Autoslide 模組爲手動塗片的玻片染色。
7. 如果系統未設置爲自動執行日常關閉周期，手動執行日常關閉過程。

Autoslide 操作

裝載試劑

如果試劑液面過低或試劑有效期已過，按下列程序裝入補充試劑：

1. 取下相應的試劑容器並更換爲新容器。
2. 在 Logs（日誌）菜單中，選擇 **Reagent Log（試劑日誌）**，然後選擇 **Autoslide Reagent Log（Autoslide 試劑日誌）**。

 軟體會打開 Reagent Inventory（試劑以清單）窗口。
3. 選擇 **Reagent Installation（試劑安裝）**。
4. 對於每種新試劑以，輸入 **Reagent Volume（試劑量）**、**Lot #（批號）**以及 **Expiration Date（有效期）**。

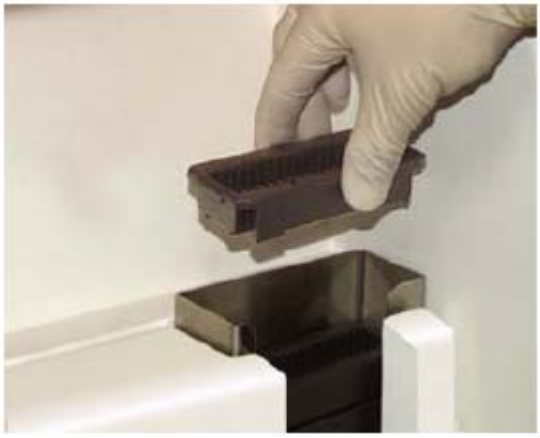
 重要訊息

 對於染色劑 1 和染色劑 2，改進型 Wright 方法和 Wright Giemsa 染色法都使用同樣的試劑瓶。爲保證試劑警報正常工作，必須使用以下算式確定輸入的量。

染色劑 1	試劑瓶容量－染色劑 2 容量
染色劑 2	試劑瓶容量 X 稀釋比率

 注意：稀釋比率在染色簡表中定義。
5. 選擇 **OK（確定）**。
6. 當提示是否灌注試劑管時，選擇 **Yes（是）**。系統只允許進行一次灌注過程，選擇 **OK（確定）**。
7. 如果試劑管中仍殘留氣泡，使用 Reagent Inventory（試劑清單）窗口再次對其進行灌注。

裝載玻片架



- 將至少兩個玻片架放入裝架器。裝架器一次最多可以承載 9 個玻片架。
- 如下圖所示裝載玻片架，玻片凹槽朝上。
- 可以隨時裝載玻片架。

裝載玻片

運行 Autoslide 啓動周期時，玻片分配器內必須有玻片，而且玻片架裝載器內必須有玻片架。

⚠警告

不要試圖清空玻片分配器！如果試圖從玻片分配器內取出玻片，可能會導致手指受傷並損壞傳感器。

顯微鏡玻片的存儲與處理

存儲和處理顯微鏡玻片時，要採取以下預防措施：

- 顯微鏡的玻片和蓋玻片在存儲時擺放位置應輪換。
- 爲避免沾染濕氣，玻片應離地存放。
- 爲將溫濕度變化降至最低，應使玻片盡可能遠離門、供熱器和空調風道。
- 請記住，不是舊玻片才會受濕氣影響。

在打開之前，應讓玻片達到實驗室溫度。



- 只能使用 Siemens 指定供應商提供的玻片。
 大小：76 x 26 X 1 mm
 描述：磨砂邊、圓角、超光澤
- 應避免用手指觸碰玻片表面。
- 玻片的控制一著色區都朝上。

- 裝載前要確保玻片未黏結在一起。
- 要確保裝載時玻片朝向正確。著色區必須在玻片朝上的一側，而且疊放時應都在左側。
- 如上圖所示，插入一疊玻片。玻片堆棧必須觸到堆棧水平面檢測器。玻片分配器內最多可放置 160 片玻片。

清空染色劑廢液容器

染色劑廢液被收集到放在分析儀下的一個容器中。定期清空染色劑廢液容器，或在系統指示已滿時清空。

必須使用所在地法規中規定的管和容器收集染色劑廢液。染色劑廢液含有甲醇。甲醇是一種溶劑，在連接不當時會導致損壞和泄漏，給用戶帶來危險並損壞分析儀。

按照所在地法規要求處理廢液。

警告

確保斷開染色劑廢液容器時，Autoslide 模組未在處理玻片。

重要訊息

所在地的法律和法規會通過管制有毒害廢棄物的處理來保護環境並鼓勵資源保護。由於分析儀產生的某些廢液屬於有毒害廢棄物，您必須熟悉所在地區適用的有毒害廢棄物處理法律與法規。

手動運行日常啓動過程

可以將系統設置爲在預先設定的時間運行啓動過程。但如果系統未做如上設置，或想要在其他時間啓動，請執行以下步驟：

1. 在 Operations（操作）菜單中，選擇 **Autoslide Control（Autoslide 控制）**。
2. 在 Autoslide Control（Autoslide 控制）選項中，選擇 **Startup（啓動）**，然後選擇 **Start（開始）**。

手工命令執行推片

可以命令執行符合軟體設置的製片標準的血液檢體推片。要手動指令樣品進行推片，使用 Data Manager（數據管理器）菜單上的 Order Entry（指令輸入）選項，將 SLIDE（玻片）”測試”添加到工作指令中。還可以創建檢體的工作指令，只包含推片測試。

1. 在 Data Manager（數據管理器）菜單中選擇 **Order Entry（工作指令輸入）**。
2. 在 Order Entry（工作指令輸入）選項中，選擇該檢體的已有工作指令或創建一個新的工作指令。
3. 將 **SLIDE（玻片）**添加到工作指令要求的測試中，然後選擇 **OK（確定）**。
4. 使用自動進樣器運行檢體。系統會按指令要求製作玻片。

對手動塗片的玻片進行染色

可以使用 Autoslide 模組對已在系統外手動塗片的玻片進行染色。

1. 確保 ADVIA 2120/2120i 分析儀未在處理檢體且在閒置狀態。
2. 在 Operations（操作）菜單中，選擇 **Autoslide Control（Autoslide 控制）**。
3. 在 **Autoslide Control（Autoslide 控制）**選項中，選擇 **Manual/STAT Door（手動／急診門）**選項，然後選擇 **Start（開始）**。
4. 門打開後，將玻片插入夾持器門，血塗片在右側且磨砂端朝上。確保玻片完全固定在夾持器中，如果未放置在底銷上，玻片可能會破碎。
5. 關閉手動／急診進氣門。系統就緒可處理玻片時，手動周期開始，該過程最多需要 30 秒時間。玻片被傳輸到染色裝置，染色操作開始。在周期結束時，玻片被裝載到架中，手動進氣門打開。
6. 插入下一個手動塗片的玻片。如果沒有其他需要染色的玻片，關閉手動／急診進氣門。
7. 恢復分析儀和 Autoslide 的正常操作。

重新設置 Autoslide 模組

在一些與 Autoslide 相關的軟體選項和窗口中會顯示 Reset Autoslide（重新設置 Autoslide）按鈕，最明顯的是在 Operations（操作）菜單中的 Autoslide Control（Autoslide 控制）選項。

點擊此按鈕可重新設置 Autoslide 模組。該功能爲智能化功能，只會重置要求重新設置的 Autoslide 裝置。在對 Autoslide 模組錯誤進行故障排除時，該功能非常有用。

根據系統狀態，該過程最多需要 16 分鐘。

停止 Autoslide 模組（Fast Stop（快停））

在一些與 Autoslide 相關的軟體選項和窗口中會顯示 **Fast Stop（快停）**按鈕，最明顯的是 Operations（操作）菜單中的 Autoslide Control（Autoslide 控制）選項。

點擊此按鈕可快速停止 Autoslide 模組。

”快停”操作會導致染片機內的所有玻片受損。

採取”快停”操作後，在返回正常系統操作前，必須先執行 Stainer Evacuation（染片機排空）。

手動運行日常關機過程

可以將系統設置爲在預先設定的時間運行關機過程。但如果系統未做如上設置，或想要在其他時間關機，請執行以下步驟：

1. 在 Operations（操作）菜單中，選擇 **Autoslide Control（Autoslide 控制）**。
2. 在 Autoslide Control（Autoslide 控制）選項中，選擇 **Shutdown（關閉）**，然後選擇 **Start（開始）**。

 重要訊息
 執行”日常關機”後，必須先執行”日常啓動”再恢復 Autoslide 操作。

斷開 Autoslide 90°配置

以下程序說明當 ADVIA Autoslide 系統採用用於實驗室自動化或作爲獨立系統的 90°。配置時，應如何將其斷開。

生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

警示

不要將承載 ADVIA Autoslide 的支撐結構移動超過 0.3 米（1 英尺）。在移動支撐結構的時候，要確保接口電線和接地母線有足夠的鬆弛量。

1. 確保在斷開 90°配置前，所有系統活動均已完成。

 注意：確保 Autoslide 染片機中沒有玻片。

2. 將 ADVIA 2120/2120i 分析儀置於待機模式。

3. 在控制面板上選擇 Off（關機），關閉 ADVIA 2120/2120i 分析儀。這會禁止其它的系統功能。系統會顯示如下消息：” communication error with autoslide（與 Autoslide 通信錯誤）” 。Autoslide 圖標保持爲綠色。

 注意：Autoslide 系統可以仍保持開機。

4. 拔出 Austoslide 檢體管(1)。

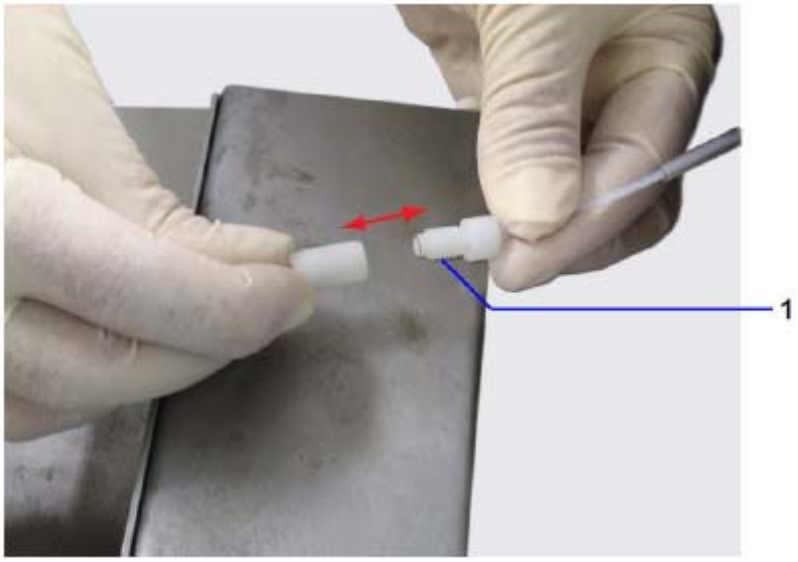


圖 1.檢體管

5. 撬開包裹著真空管(1)和壓力(2)管的保護性套管。

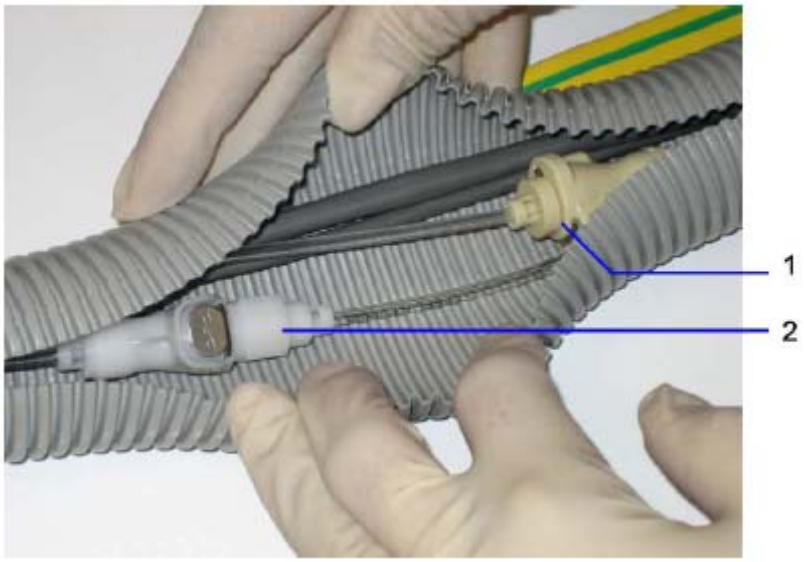


圖 2.真空管和壓力管

6. 推動金屬柄，將真空管(1)拉出斷開。

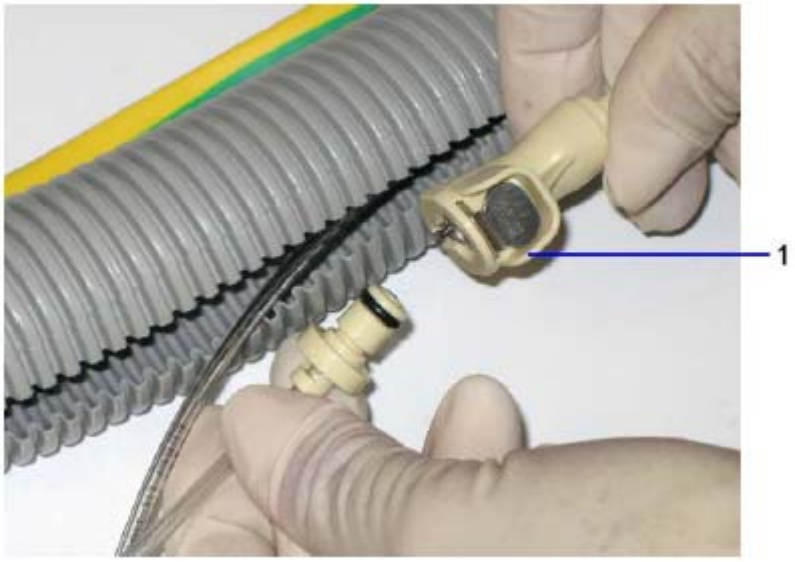


圖 3.真空管

7. 推動金屬柄，將真空管(1)拉出斷開。

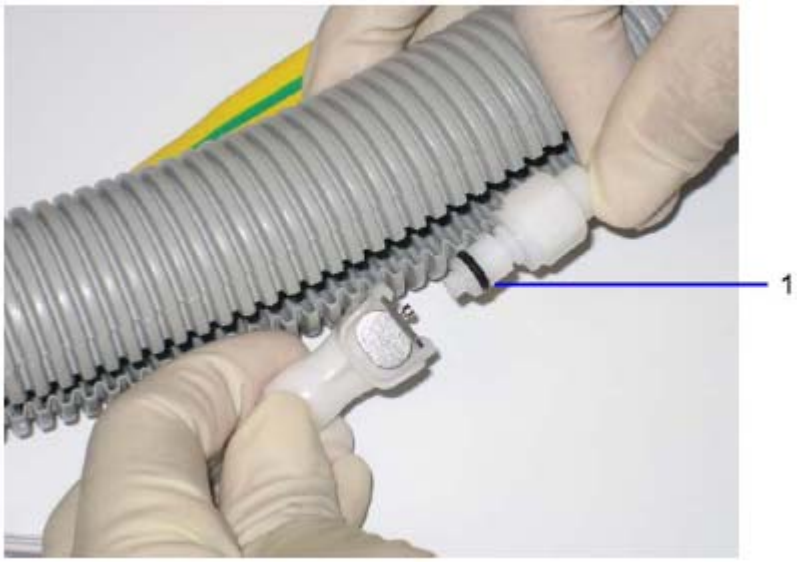


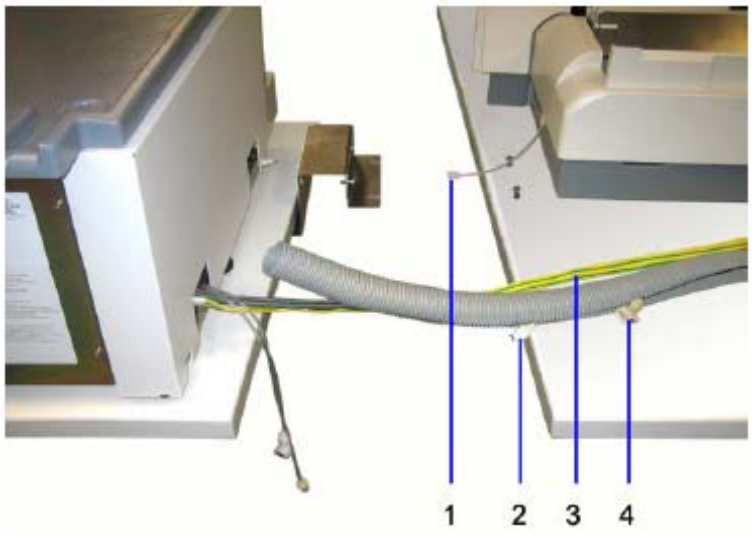
圖 4.壓力管

8. 鬆開將插槽固定在 Autoslide 裝載托架上的兩顆螺釘，這樣就可以移動支撐結構。



圖 5.鬆開螺釘的 Autoslide 承載托架

9. 將支撐結構最多向前移動 0.3 米（1 英尺），以防電源線拉伸過長。



1 檢體管
2 壓力管
3 接地母線
4 真空管

圖 6.移動後的支撐結構

注意：接地母線和接口電線仍與 Autoslide 保持連接。斷開檢體管、壓力管以及真空管，以便將 Autoslide 移動約 0.3 米（1 英尺）。

10. 要重新連接 Autoslide，將 Autoslide 模組移回原位。
11. 擰緊固定螺釘。
12. 更換並連接在步驟 4-8 中斷開的所有管線。
13. 重新連接完成後，將 ADVIA 2120/2120i 分析儀重新打開。

 Autoslide 圖標變成灰色。等待 Autoslide 與分析儀建立通信。圖標從灰色變爲橙色，然後變爲綠色。在通信建立且 Autoslide 圖標變成綠色前，不要發出任何命令。

Autoslide 染色法

May-Grünwald Giemsa 染色法

預計用途

May-Grünwald Giemsa 染色法用於體外診斷，用於在 ADVIA Autoslide 製片染片機上進行血液、骨髓及體液塗片的分類染色。評估染色塗片是爲了識別並量化全血檢體及其他檢體內的細胞，以幫助臨床人員評估不同的臨床狀況。

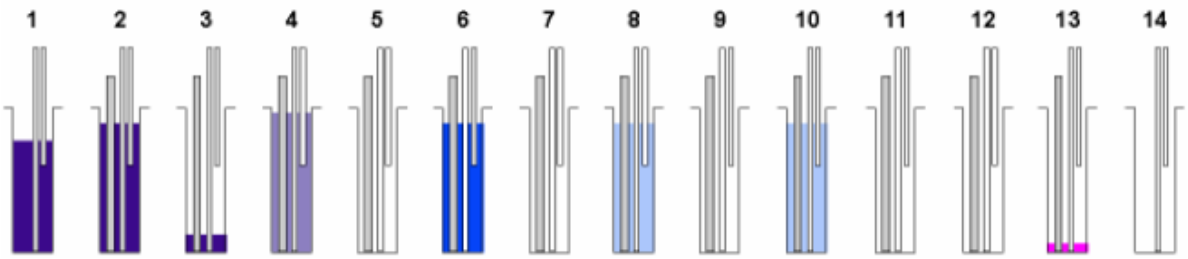
總結與說明

ADVIA Autoslide 製片染片機的試劑方案包括改良的亞甲基藍一伊紅染色劑，此方案基於由 Pappenheim 提出的原始染色劑。

ADVIA Autoslide 製片染片機是一個智能化的全自動系統。它能夠對在 ADVIA 2120/2120i 分析儀上檢測的所有檢體製片，或僅對符合預定義標準（如警示或參數閾值）的檢體推片。Autoslide 模組還爲預先塗片的玻片提供連接染片機的直接進入端口。

染色方案

下面是對該染色方案的簡要描述：



1. 加入 May-Grünwald 染色劑（染色劑）(DN1)。
2. 放入玻片。
3. 排出部分 May-Grünwald 染色劑（染色劑）(AN2)。
4. 加入緩衝劑來稀釋 May-Grünwald 染色劑（染色劑）(DN3)。
5. 排空（AN3）。
6. 加入稀釋的 Giemsa 染色劑（染色劑 2）(DN3)。
7. 排空(AN7)。
8. 加入沖洗液（蒸餾水）(DN7)。
9. 排空(AN7)。
10. 加入沖洗液（蒸餾水）(DN7)。
11. 排空(A N7)。
12. 排空(AN4)。
13. 加入甲醇(DN4)。
14. 取出玻片

針	位置	操作
DN1（未稀釋染色劑 1）	32	1
DN2（緩衝劑）	8	1
DN3（稀釋染色劑 2）	13	1
DN4（甲醇）	3	10
DN7（沖洗液）	18	2
AN2	8	1
AN3	31	1
AN4	31	1
AN7	18	3

甲醇量(mL)	1.6
染色劑量(mL)	3.6
稀釋比率(%)	5
持續時間	長

過程原則

該方案使用的兩種混合染色劑具有相差非常急殊的屬性。May-Grünwald（染色劑 1）爲細胞的嗜酸性顆粒部位和白細胞中的嗜中性粒細胞顆粒染色；而 Giemsa（染色劑 2）爲單核細胞和淋巴細胞的細胞質，以及核染色質染色。使用顯微鏡檢查染色的塗片，然後手工對細胞進行分業和量化。

細胞類型	細胞成分	顏色
嗜中性粒細胞	細胞核	深紫色
	細胞質	粉色
	顆粒	淺紫羅蘭色
淋巴細胞	細胞核	深紫色
	細胞質	藍色
單核細胞	細胞核	淺紫色
	細胞質	藍灰色
	顆粒	粉色到紫羅蘭色
嗜酸性粒細胞	細胞核	淡藍紫色
	細胞質	偏藍的粉色
	顆粒	橙色
嗜鹼性粒細胞	細胞核	藍紫色
	細胞質	淡粉色
	顆粒	深紫色

細胞類型	細胞成分	顏色
血小板	細胞質	淺藍色
	顆粒	藍色到紫藍色
紅血球	雙凹圓盤樣	粉色
Howell-Jolly 小體		深紫色
杜勒氏小體		藍灰色
早幼粒細胞和 Auer 小體	顆粒	深藍色到紫紅色

紅血球偽影的成因

- 染色後沖洗時間過短
- 試劑過期
- May-Grünwald 染色劑打開的時間過長
- 染片機髒污
- 室溫過高
- 濕度過高
- 檢查前玻片不乾燥

試劑和耗材

用於*體外*診斷。

試劑已就緒，無需準備。

REF	內容物	符號	容量
00283949 00327415（日本）	May-Grünwald 染色劑 1	① STN	4 x 25L
00283167 00327733（日本）	Giemsa 染色劑 2	② STN	6 x 0.5L
00284988	May-Grünwald Giemsa 緩衝劑	BUF	4 x 25L
00286794 00326788（日本）	甲醇	CH_3OH	4 x 25L

REF	內容物	符號	容量
06837687	ADVIA Autoslide 沖洗劑	RNS	10L

染色劑 1－May-Grünwald 染色劑

- 甲醇，99.65%
- 亞甲基藍一伊紅，0.35%



R39/23/24/25
S7, S24,
S36/37, S45

有毒！有毒！吸入、皮膚接觸或吞食都會導致十分嚴重的不可逆危險後果。注意蓋好容器。避免接觸皮膚。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼當標籤）。含有甲醇



R11
S16

高度易燃！高度易燃。遠離火源－禁止吸烟。含有甲醇。

染色劑 2－Giemsa 染色劑

- 甲醇，56%
- 甘油，43%
- 亞甲基藍一伊紅，1%



R39/23/24/25
S7, S24,
S36/37, S45

有毒！有毒！吸入、皮膚接觸或吞食都會導致十分嚴重的不可逆危險後果。注意蓋好容器。避免接觸皮膚。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼當標籤）。含有甲醇。



R11
S16

高度易燃！高度易燃。遠離火源－禁止吸烟。含有甲醇。

May-Grünwald 緩衝劑

- Phosphate 緩衝劑
- 防腐劑

甲醇

- 甲醇≥ 99.8%



R39/23/24/25
S7, S24, S36/37, S45

有毒！有毒！吸入、皮膚接觸或吞食都會導致十分嚴重的不可逆危險後果。注意蓋好容器。避免接觸皮膚。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼當標籤）。含有甲醇。



R11
S16

高度易燃！高度易燃。遠離火源－禁止吸烟。含有甲醇。

試劑的存儲與穩定性

將染色劑、緩衝劑和甲醇在 15℃～25℃的環境中密閉存儲。

用封口膜或相近物品蓋住打開的試劑瓶以避免過度揮發。

未打開的試劑如存放在室溫爲 15℃～30℃的環境，則在產品標籤上印刷的有效期內是穩定的。

一旦打開之後，試劑在 45 天內會保持穩定。

請勿冷藏。

有關檢體收集的訊息，請參考 ADVIA 2120/2120i 分析儀操作者在線指南。

未提供的所需材料

顯微鏡玻片(26 x 76 x 1 mm)
大小：76 x 26 x 1 mm
描述：磨砂邊、圓角、超光澤

只能使用 Siemens 指定供應商提供的玻片。

限制

May-Grünwald Giemsa 試劑能夠製作高質量的染色血塗片。但由於個人偏好的原因，有可能會對該系統染色的色度和強度方面不滿意。

結果

當用於 ADVIA Autoslide 製片染片機時，May-Grünwald Giemsa 試劑以能提供始終如一的染色質量，有助於對結果做出精確可靠的解釋。

技術支持

如需客戶支持，請與您當地的技術支持提供商或代理商聯繫。

參考書目

1. White WL, Erickson MM, Stevens SC. *Practical Automation for the Clinical Laboratory.* St. Louis, MO, CV Mosby Co., pp 476-487 (1927)
2. Moss ED. Automated Slide Staining in Haematology. *Can. J. Med. Tech*. **30 (5)**: 169 (1968)
3. Langeron M., *Precis de microscopie, Masson*, Paris 6eme ed., pp 566-585 (1942)

改進的 **Wright** 染色法

預計用途

改進的 Wright 染色法用於體外診斷，用於在 ADVIA Autoslide 製片染片機上進行血液、骨髓及體液塗片的分類染色。評估染色的塗片是爲了識別並量化全血檢體及其他檢體內的細胞，以幫助臨床人員評估不同的臨床狀況。

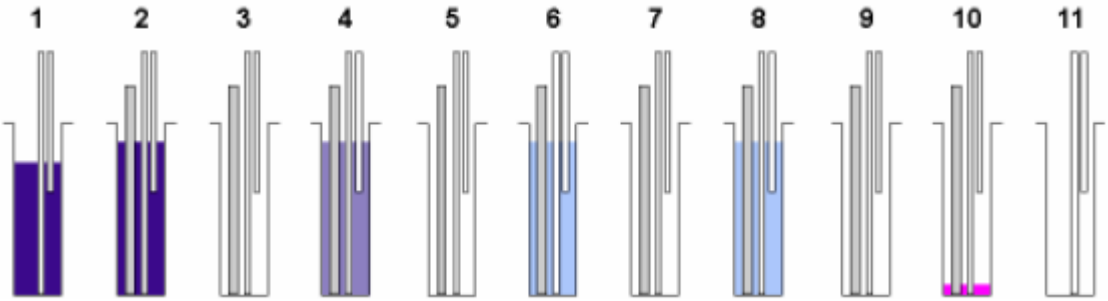
總結與說明

ADVIA Autoslide 製片染片機的試劑方案包括改進的亞甲基藍一伊紅染色劑，此方案基於由 Romanowsky 提出的原始染色劑。

ADVIA Autoslide 製片染片機是一個智能化的全自動系統。它能夠對在 ADVIA 2120/2120i 分析儀上檢測的所有檢體製片，或僅對符合預定義標準（如警示或參數閾值）的檢體推片。Autoslide 模組還爲預先塗片的玻片提供連接染片機的直接進入端口。

染色方案

下面是對該染色方案的簡要描述：



1. 加入改進型 Wright 或 Wright – Giemsa 染色劑(DN1)。
2. 放入玻片。
3. 排空改進型 Wright 或 Wright – Giemsa 染色劑(AN3)。
4. 加入改進型 Wright 或 Wright – Giemsa 染色劑(DN3)。
5. 排空(AN7)。

6. 加入沖洗液（蒸餾水）(DN7)。
7. 排空(AN7)。
8. 加入沖洗液（蒸餾水）(DN7)。
9. 排空(AN4)。
10. 加入甲醇(DN4)。
11. 取出玻片。

針	位置	操作
DN1（未稀釋染色劑 1）	32	1
DN2（緩衝劑）	22	0
DN3（稀釋染色劑 2）	8	1
DN4（甲醇）	31	0
DN7（沖洗液）	24	2
AN2	22	0
AN3	8	1
AN4	31	1
AN7	24	2

注意：未在此方案中使用位置 22 處的 AN2 針和 DN2 針。

甲醇量(mL)	1.6
染色劑量(mL)	3.6
稀釋比率(%)	25
持矮時間	長

過程原則

通過顯微鏡檢查染色的塗片，嗜中性粒細胞、淋巴細胞、單核細胞、嗜酸性粒細胞以及嗜鹼性粒細胞的細胞核與細胞質顯示出典型的藍色或紅色著色。然後手工對細胞進行分類和量化。

細胞類型	細胞成分	顏色
嗜中性粒細胞	細胞核	鮮艷的深紫色
	細胞質	粉色背景
	顆粒	淺紫羅蘭色
淋巴細胞	細胞核	清晰的深紫色
	細胞質	天藍色到深藍色
單核細胞	細胞核	淡紫色，染色質束之間有明顯的空隙
	細胞質	暗藍灰色，有輕微染色

細胞類型	細胞成分	顏色
	顆粒	粉色到紫羅蘭色，均與分布
嗜酸性粒細胞	細胞核	淡藍紫色，形狀規整
	細胞質	偏藍的粉色
	顆粒	橘紅色，形狀爲大的球形
嗜鹼性粒細胞	細胞核	藍紫色，可能略帶紅色調
	細胞質	淡粉色
	顆粒	鮮明的深藍紫色到黑紫色
血小板	細胞質	清晰的淡藍色
	顆粒	個體小，藍色到紫藍色，趨於向中央聚集
紅血球	雙凹圓盤樣	顏色爲微紅到偏紅的粉色，在細胞最薄的中央區域染色強度較弱。
Howell-Jolly 小體		深紫色
杜勒氏小體		淺藍至淺藍灰色
早幼粒細胞	顆粒	深藍色至品藍色
Auer 小體		紫紅色

紅血球僞影的成因

- 染色後沖洗時間過短
- 試劑過期
- 染色劑打開時間過長
- 染片機髒污
- 室溫過高
- 濕度過高
- 檢查前玻片不乾燥

試劑和耗材

用於*體外*診斷。

試劑已就緒，無需準備。

REF	內容物	符號	容量
08100142 0097053（日本）	改進型 Wright 染色劑	① STN	4 x 3.8 L（1 美制加侖）
08100290	改進型 Wright 緩衝劑	BUF	4 x 3.8 L（1 美制加侖）
08096412 00096669（日本）	甲醇	CH_3OH	4 x 3.8 L（1 美制加侖）
06837687	ADVIA Autoslide 沖洗劑	RNS	10 L

改進型 Wright 染色劑

- 甲醇，> 99%
- 多色亞甲基藍一伊紅染色劑，0.3%



R39/23/24/25
S7, S24,S36/37, S45

有毒！有毒！吸入、皮膚接觸或吞食都會導致十分嚴重的不可逆危險後果。注意蓋好容器。避免接觸皮膚。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼標籤）。含有甲醇。



R11
S16

高度易燃！高度易燃。遠離火源－禁止吸烟。含有甲醇。

改進型 Wright 緩衝劑

- Phosphate 緩衝劑
- 表面活性劑

甲醇

- 甲醇≥ 99.8%



R39/23/24/25
S7, S24,S36/37, S45

有毒！有毒！吸入、皮膚接觸或吞食都會導致十分嚴重的不可逆危險後果。注意蓋好容器。避免接觸皮膚。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助（在適當位置黏貼標籤）。含有甲醇。



R11
S16

高度易燃！高度易燃。遠離火源－禁止吸烟。含有甲醇。

試劑的存儲與穩定性

將染色劑、緩衝劑和甲醇在 15℃～30℃的環境中密閒存儲。

用封口膜或相近物品蓋住打開的試劑瓶以避免過度揮發。

未打開的試劑如存放在室溫爲 15℃～30℃的環境，則在產品標籤上印刷的有效期內是穩定的。

一旦打開之後，試劑在 45 天內會保持穩定。

請勿冷藏。

有關檢體收集的訊息，請參考 ADVIA 2120/2120i 分析儀操作者在線指南。

未提供的所需材料

顯微鏡玻片(26 x 76 x 1 mm)
大小：76 x 26 X 1 mm
描述：磨砂邊、圓角、超光澤

只能使用 Siemens 指定供應商提供的玻片。

限制

改進的 Wright 試劑以能夠製作高質量的染色血塗片。但由於個人偏好的原因，有可能會對該系統染色的色度和強度方面不滿意。

結果

當用於 ADVIA Autoslide 製片染片機時，改進型 Wright 試劑以能提供始終如一的染色質量，有助於對結果做出精確可靠的解釋。

技術支持

如需客戶支持，請與您當地的技術支持提供商或代理商聯繫。

參考書目

1. Romanowsky DL. On the Question of Parasitology and Therapy of Malaria. *St. Petersburg Medical Weekly* **16**: 297-302 (1891)
2. White WL, Erickson MM, Stevens SC. Practical Automation for the Clinical Laboratory. St. Louis, MO, CV Mosby Co., pp 476- 487 (1972)
3. Moss ED. Automated Slied Staining in Haematology. *Can. J. Med. Tech.* **30 (5)**: 169 (1968)

Wright Giemsa 染色法

預計用途

Wright Giemsa 染色法用於*體外*診斷，用於在 ADVIA Autoslide 製片染片機上進行血液、骨髓及體液塗片的分類染色。評估染色塗片是爲了識別並量化全血檢體及其他檢體內的細胞，以幫助臨床人員評估不同的臨床狀況。

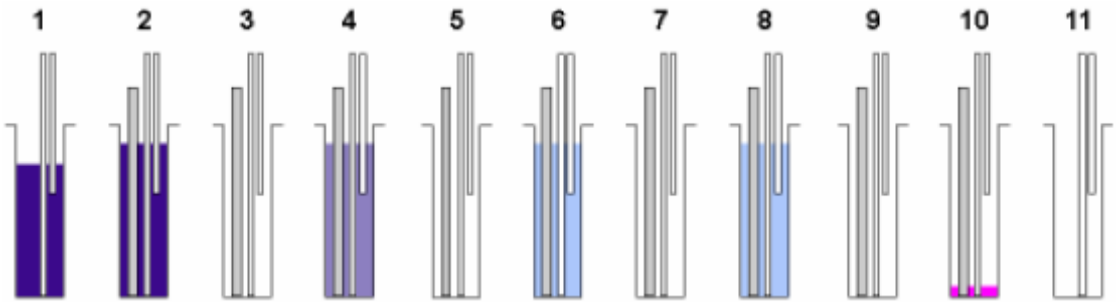
總結與說明

ADVIA Autoslide 製片染片機的試劑方案包括改進的亞甲基藍一伊紅染色劑，此方案基於由 Romanowsky 提出的原始染色劑。

ADVIA Autoslide 製片染片機是一個智能化的全自動系統。它能夠對在 ADVIA 2120/2120i 分析儀上檢測的所有檢體製片，或僅對符合預定義標準（如警示或參數閾值）的檢體推片。Autoslide 模組還爲預先塗片的玻片提供連接染片機的直接進入端口。

染色方案

下面是對該染色方案的簡要描述：



1. 加入改進型 Wright 或 Wright-Giemsa 染色劑(DN1)。
2. 放入玻片。
3. 排空改進型 Wright 或 Wright-Giemsa 染色劑(AN3)。
4. 加入改進型 Wright 或 Wright-Giemsa 染色劑(DN3)。
5. 排空(AN7)。
6. 加入沖洗液（蒸餾水）(DN7)。
7. 排空(AN7)。
8. 加入沖洗液（蒸餾水）(DN7)。
9. 排空(AN4)。
10. 加入甲醇(DN4)。
11. 取出玻片。

針	位置	操作
DN1（未稀釋染色劑 1）	32	1
DN2（緩衝劑）	22	0
DN3（稀釋染色劑 2）	8	1
DN4（甲醇）	31	0
DN7（沖洗液）	24	2
AN2	22	0
AN3	8	1
AN4	31	1
AN7	24	2

注意：未在此方案中使用位置 22 處的 AN2 針和 DN2 針。

甲醇量(mL)	4
染色劑量(mL)	3.6
稀釋比率(%)	25
持續時間	長

過程原則

通過顯微鏡檢查染色的塗片，嗜中性粒細胞、淋巴細胞、單核細胞、嗜酸性粒細胞以及嗜鹼性粒細胞的細胞核與細胞質顯示出典型的藍色或紅色著色。然後手工對細胞進行分類和量化。

細胞類型	細胞成分	顏色
嗜中性粒細胞	細胞核	鮮艷的深紫色
	細胞質	粉色背景
	顆粒	淺紫羅蘭色
淋巴細胞	細胞核	清晰的深紫色
	細胞質	天藍色到深藍色
單核細胞	細胞核	淡紫色，染色質束之間有明顯的空隙
	細胞質	暗藍灰色，有輕微染色
	顆粒	粉色到紫羅蘭色，均與分布
嗜酸性粒細胞	細胞核	淡藍紫色，形狀規整
	細胞質	偏藍的粉色
	顆粒	橘紅色，形狀爲大的球形
嗜鹼性粒細胞	細胞核	藍紫色，可能略帶紅色調
	細胞質	淡粉色
	顆粒	鮮明的深藍紫色到黑紫色

細胞類型	細胞成分	顏色
血小板	細胞質	清晰的淡藍色
	顆粒	個體小，藍色到紫藍色，趨於向中央聚集
紅血球	雙凹圓盤樣	顏色爲微紅到偏紅的粉色，在細胞最薄的中央區域染色強度較弱。
Howell-Jolly 小體		深紫色
杜勒氏小體		淺藍至淺藍灰色
早幼粒細胞	顆粒	深藍色至品藍色
Auer 小體		紫紅色

紅血球僞影的成因

- 染色後沖洗時間過短
- 試劑過期
- 染色劑打開時間過長
- 染片機髒污
- 室溫過高
- 濕度過高
- 檢查前玻片不乾燥

試劑和耗材

用於*體外*診斷。

試劑已就緒，無需準備。

REF	內容物	符號	容量
08096536 00097185（日本）	Wright Giemsa 染色劑		4 x 3.8 L（1 美制加侖）
08097532	Wright Giemsa 緩衝劑		4 x 3.8 L（1 美制加侖）

REF	內容物	符號	容量
08096412 00096669（日本）	甲醇	CH_3OH	4 x 3.8 L（1 美制加侖）
06837687	ADVIA Autoslide 沖洗劑	BUF	10 L

wright Giemsa 染色劑

- 甲醇，> 99%
- 多色亞甲基藍一伊紅染色劑



R39/23/24/25
S7, S24,S36/37, S45

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Wright Giemsa 緩沖劑

- Phosphate 緩衝劑
- 表面活性劑
- 防腐劑

甲醇

- 甲醇＝99.8%



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只能使用 Siemens 指定供應商提供的玻片。大小：

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Wright Giemsa 試劑能夠製作高質量的染色血塗片。但由於個人偏好的原因，有可能會對該系統染色的色度和強度方面不滿意。

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當用於 ADVIA Autoslide 製片染片機時，Wright Giemsa 試劑以能提供始終如一的染色質量，有助於對結果做出精確可靠的解釋。

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參考書目

1. Romanowsky DL. On the Question of Parasitology and Therapy of Malaria. *St. Petersburg Medical Weekly* **16**: 297-302 (1891)
2. White WL, Erickson MM, Stevens SC. Practical Automation for the Clinical Laboratory. St. Louis, MO, CV Mosby Co., pp 476- 487 (1972)
3. Moss ED. Automated Slied Staining in Haematology. *Can. J. Med. Tech.* **30 (5)**: 169 (1968)

定期維護

爲保證 Autoslide 的運行效率，請務必遵循下面列出的簡單維護程序：

每周

- 清除玻璃碎屑廢棄物
- 清洗染色劑溢流盤

- 執行每周關機和啓動

處理 3000 個玻片後

- 清洗染片機的染色池和托盤
- 清潔電源風扇濾網

根據需要

- 更換塗片帶並清潔楔形塗片
- 更換印表機色帶

清除玻璃碎屑廢棄物

將玻片從玻片分配器傳輸到玻片載體的過程中，小玻璃碎屑可能會將其割傷。這些碎屑收集在玻片分配器下方的一個托盤中。

清除玻璃碎屑廢棄物

警告

當處理有鋒利邊緣的物體或為其排除故障時，要小心僅慎。這些邊緣可能會導致割傷。

1. 用雙手小心地將玻片分配器下方的托盤向身體方向拉出取下。



2. 根據實驗室標準程序丟棄玻璃碎屑。

3. 將托盤放回，固定在玻片分配器下方。

清洗染色劑溢流盤

生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，操作者應按照美國臨床實驗室標準化委員會(NCCLS) M29-A號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

可能有少量染色劑從染片機筒溢出。這些溢流物收集在 Autoslide 一端染片機模組下的托盤內。

清洗染色劑溢流盤

1. 用雙手小心拉出放置於染片機模組下方的托盤，將其取下。



2. 用 10%的漂白劑溶液醮濕毛巾或紙巾，將托盤擦拭乾淨。
3. 讓托盤自然風乾，然後將其放回染片機模組下固定好。

執行每周關機和啓動

每周關機過程提供對流控回路的徹底清潔，必須每周執行一次。未定期執行關機過程可能導致管路阻塞。



有毒！

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易燃

甲醇是易燃品。遠離火源－禁止吸烟。

要執行每周關機過程

1. 在 ADVIA 2120/2120i 軟體菜單中，選擇 **Procedures（過程）**，然後選擇 **Clean Autoslide（清潔 Autoslide）**。

 Clean Autoslide（清潔 Autoslide）窗口打開。

2. 選擇 **Weekly Shutdown（每周關機）**，按照窗口中顯示的說明執行每周關機。

3. 完成每周關機後，必須先執行每周啓動再恢復玻片製作操作。如果希望在完成每周關機後關閉系統，在執行每周啓動前，等待直至已準備好運行更多檢體。

4. 在 Clean Autoslide（清潔 Autoslide）窗口中，選擇

 Weekly Startup（每周啓動）。

5. 按照窗口中顯示的說明執行每周啓動。

清洗染片機的染色池和托盤



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於有可能傳染疾病的檢體，操作者應按照美國臨床實驗室標準化委員會(NCCLS) M29-A號文件，即《Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue, 2nd edition; Approved Guideline (1997)》中的建議進行操作，防止傳染性試劑在醫療機構內傳播。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。

所需材料：

- 甲醇
- 實驗室用托盤
- 紙巾

時間：15 分鐘

分析儀模式：待機

注意

建議每年更換一次染片池。有關訂購訊息，請查看操作者指南中的”可更換部件”一節。



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甲醇有毒性。為避免嚴重的不可逆危險後果，不要吸入和接觸皮膚或吞食。穿戴適當的防護服和防護手套。如發生意外或感覺不適，請立即尋求醫生幫助。



易燃

甲醇是易燃品。遠離火源－禁止吸烟。



警示

在關閉 Autoslide 之前要確保所有玻片都已處理且傳輸到了輸出隊列。處理玻片時關閉 Autoslide 會導致結果不可靠，而且可能損壞 Autoslide 組件。

1. 將分析儀置於 Standby（待機）模式並關閉 Autoslide。
2. 滑動打開染片機托盤門。



3. 手工旋轉染片機板，輕輕將每個染片池滑出染片機。



警示

取出染色池時不要太用力。過於用力地向上或向外拔會損傷染色池。應該用將其輕輕夾出或放入染片機盤上的位置。

將染片機筒放入托盤，確保其完全浸入托盤內的甲醇中。晃動托盤以清除所有氣泡。

4. 染色筒浸透後，用軟布或紙巾將染片機板擦拭乾淨。手工旋轉染片機板以清潔整個表面。



5. 染色池浸入甲醇 10 分鐘後，將其從托盤中取出，用紙巾擦乾。
6. 旋轉染片機板，將每個底部有凹槽的染色池裝回最靠近板緣處。

 確保染片機池妥善固定在染片機托盤內，且高度一致。

7. 滑動關閉染片機托盤門。

8. 將分析儀置於 Ready（準備）模式並關閉 Autoslide。

清洗風扇過濾器

1. 關閉 Autoslide 背部的電源開關。

2. 取下風扇罩並拆下過濾網。



3. 使用吸塵器或空氣濾罐清除過濾網上的所有塵垢。

4. 將乾淨的濾網與罩組裝好，將其裝回儀器後部的原位。

更換塗片帶並清潔推片楔



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所需物品：

- 新塗片帶
- 紙巾

時間：2 分鐘

分析儀模式：待機

要更換塗片帶

1. 在 Operations（操作）菜單中，選擇 **Autoslide Control（Autoslide 控制）**。

 Clean Autoslide（清潔 Autoslide）窗口打開。

2. 在 Special Functions（特殊功能）部分中，選擇 **Smearing Tape（塗片帶）**。

3. 在 Smearing Tape Options（塗片帶選項）下，選擇 **Replace Tape（更換塗片帶）**。

4. 打開 Autoslide 前下方的蓋板。

5. 使用黑色磁性旋鈕打開塗片帶架板。

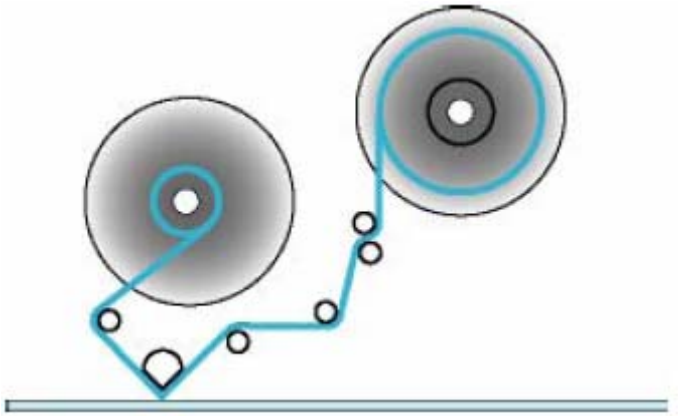


6. 將上下筒管從其架上取下。

7. 每次更換塗片帶時，都用軟布擦拭楔形塗片，清除所有灰塵。



8. 將新的塗片帶筒管放置在上面的架上，並將卷繞筒管放置在下面的架上。小心不要使塗片帶扭曲或褶皺。按前蓋板內側上的圖解所示將其穿過轉軸。



9. 關閉塗片帶架板。

10. 在 Autoslide Control（Autoslide 控制）窗口中，選擇 **Start（開始）**收緊塗片帶。

更換印表機色帶

所需材料：新列印墨盒

- 時間：2 分鐘
- 分析儀模式：待機

要更換列印色帶

警示

在關閉 Autoslide 之前，要確保所有玻片都已處理且傳輸到了輸出隊列。處理玻片時關閉 Autoslide 會導致結果不可靠，而且可能損壞 Autoslide 組件。

1. 關閉 Autoslide。

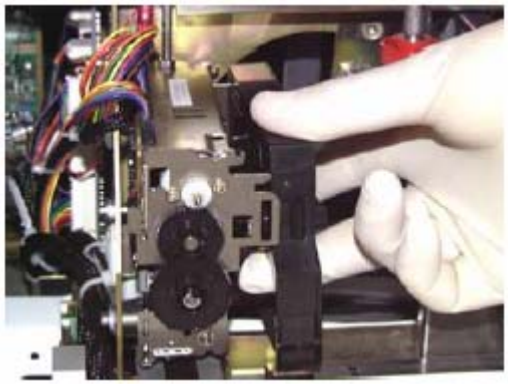
2. 打開前下方蓋板，取出玻片架裝載器，以方便拿取列印色帶。



注意

取出玻片架裝載器會導致 ASL Stop（ASL 停止）狀態。在這一過程結束時，執行 Autoslide 機械初始化後這個消息將會解除。

3. 抓住印表機墨盒的兩端，向 Autoslide 內部方向壓，將墨盒從其支架上取出。取出時注意不要使色帶纏繞。



4. 將新印表機墨盒固定在其支架上。確保墨盒上的凹槽對準相應位置以便固定在支架上。
5. 放回玻片架裝載器，關閉前下方蓋板。
6. 將分析儀置於 Ready（就緒）模式，然後打開 Autoslide。等數秒鐘。Autoslide 將執行機械初始化。*必須*等待初始化以自動執行。

更換 Autoslide 保險絲

重要訊息

*不要*試圖更換 Autoslide 保險絲。

要更換任何 Autoslide 保險絲，請致電 Siemens 技術支持供應商或代理商。

錯誤消息與建議操作

下面的列表包含對可能出現的 Autoslide 錯誤的說明和操作措施。在某些情況下，建議操作會向您推薦下面的故障排除提示，幫助您解決問題並將系統恢復到正常操作狀態。

處於 **Failure（故障）**狀態表明需要進行干預，才能繼續使用 Autoslide。而 **Warning（警告）**狀態表明需要進行干預以阻止最終故障。

如果下面描述的建議操作無法解決問題，請致電您的技術支持供應商或代理商。

提示 1

Autoslide 可能未立即響應命令，在某些情況下，可能需要長達 30 秒的時間分析儀才會響應。這是由於 ADVIA 2120/2120i 分析儀與 Autoslide 之間的通信限制。請耐心等待系統響應一不要不停點擊滑鼠。

提示 2

除解決問題根源（如取出阻塞的玻片架等）外，出現錯誤時要檢查 Autoslide 狀態屏幕。如果染片機和塗片器都顯示爲 RED（紅色），而且染片機中沒有玻片，則必須執行 **MECHANICAL INITIALIZATION（機械初始化）**（將染片機和塗片器歸位）。如果只有塗片器爲 RED（紅色），執行 **RESET SMEARER（重置塗片器）**，將系統恢復爲”Ready（就緒）”（綠色），並保證繼續處理所有當前正在染色的玻片。

提示 3

如果 Autoslide 狀態屏幕對染片機的顯示爲 RED（紅色），而且正在處理玻片，**RESET AUTOSLIDE（重置 AUTOSLIDE）**操作執行機械初始化，然後排空並取出玻片。

提示 4

Autoslide 錯誤消息會按其出現順序記錄在消息日誌中。如果顯示嚴重錯誤，轉到出現嚴重錯誤之前的顯示，並點擊 Details（詳細訊息）了解有關問題的更多訊息。

提示 5

如果出於任何原因需要將 Autoslide 的電源切斷然後接通，應允許儀器重新連接與 ADVIA 2120/2120i 分析儀的通信鏈接，不要中斷該過程。

重要訊息：事件／原因／建議操作下的表緊隨操作者指南中當前顯示的表出現。

事件文本	嚴重性	可能原因	建議操作
ASL－吸取針收回超時	故障	吸取針無法按時收回	執行機械初始化既重置 Autoslide，如有必要，檢查自動進樣器，執行自動進樣器重置或關閉／打開 ADVIA 2120/2120i 分析儀的電源
ASL－命令超時一停止	故障	Autoslide 中的命令超時如果設置了嚴重錯誤的 Alarm/Stop（警報／停止）標準，運行停止	執行機械初始化既重置 Autoslide，如果問題仍然存在，關閉並再次接通 Autoslide 電源，並致電 Siemens 公司。
ASL－通信錯誤	故障	分析模組與 Autoslide 之間的通信丟失	檢查分析儀與 Autoslide 同的串行 I/O 電幾，將 Autoslide 電源接通，執行機械初始化
ASL－配置／參數錯誤	故障	使用了無效參數配置 Autoslide	執行機械初始化來重置 Autoslide，並將錯誤報告給 Siemens 公司
ASL－嚴重錯誤一停止	故障	常見 Autoslide 嚴重錯誤（軟體錯誤、不能識別版本、緊急停止、通信、錯誤參數、EEPROM 錯誤、未初始化、同步錯誤、檢體可能被稀釋、硬件錯誤、Autoslide 接口錯誤、命令超時、命令狀態等）。如果設置了 Alarm/Stop（警報／停止）標準，運行停止。	檢查消息日誌中是否有其他錯誤，糾正問題，重置 Autoslide 一請參考提示 2。

事件文本	嚴重性	可能原因	建議操作
ASL－分配器錯誤	故障	分配器機械錯誤	檢查分配器區域。查找黏結或破碎的玻片。確保裝載足夠玻片既覆蓋兩個玻片傳感器，繼續按照提示 2 操作
ASL － EEPROM 錯誤	故障	初始化過程中 EEPROM 讀／寫錯誤。	請致電 Siemens 公司
ASL － EEPROM 錯誤	故障	在讀取或更新 EEPROM 時出現錯誤。	執行機械初始化既重置 Autoslide，如果問題仍然存在，關閉並再次接通 Autoslide 電源，並致電 Siemens 公司。
ASL－緊急停止周期	故障	Autoslide 在忙時蓋板可能是打開的。	關閉蓋板並重置 Autoslide 請參見提示 2 和提示 3
ASL－硬件錯誤	故障	發生硬件錯誤	檢查消息日誌中是否有其他錯誤，糾正問題，重置 Autoslide－請參考提示 2。請致電 Siemens 公司。
ASL－無法沖洗	故障	無法沖洗檢體或沉積管。正在處理其他命令。	執行機械初始化。如果問題仍持續存在，請致電 Siemens 公司。
ASL－內部軟體錯誤	故障	軟體初始化問題或輸入了錯誤數據。	輸入正確訊息。運行機械初始化周期如果問題無法解抉，請致電您的 Siemens 代表。
ASL－內部軟體錯誤	故障	Autoslide 內部同步錯誤。	執行機械初始化。如果問題仍然存在，請致電 Siemens 公司。
ASL－針板錯誤	故障	染色針位置放置錯誤	打開蓋板識別問題。關閉蓋板。請參考提示 2 和提示 3 如果針觸擊玻片，請致電 Siemens 公司
ASL－操作既錯誤結束	故障	運行停止一 Autoslide 命令以錯誤結束。	查看 Message Log - Detail（消息日誌－詳細訊息）屏幕查找原因，糾正問題並執行機械初始化。
ASL－印表機錯誤	故障	印表機色帶不前移或阻塞	打開前面板，檢查印表機色帶一按需要清除阻塞或更換色帶。確保印表機區域無玻璃碎屑。運行機械初始化周期必要時將 Autoslide 電源斷開再接通。
ASL－嚴重錯誤一停止	故障	常見的架錯誤可能是架數量不足。	向分配器中添加架，查找阻塞的架或完全彈出的托盤。運行重置塗片器（請參見上文中的提示）。
ASL－嚴重錯誤一停止	故障	架處理器執硬件錯誤	查找阻塞的架或碎屑。運行重置塗片器（請參見上文中的提示）。
ASL－玻片載體錯誤	故障	玻片未能按時放入載體，或裝載不正確	清除玻片並檢查該區域是否有玻璃碎屑，然後參考故障排除提示 2。

事件文本	嚴重性	可能原因	建議操作
ASL－嚴重錯誤一停止	故障	塗片器門是打開的如果設置了 Alarm/Stop（警報／停止）標準，運行停止。	關閉塗片器門，重置塗片器（請參見提示 2。）
ASL－塗片模組門打開	故障	塗片模組門打開	關閉塗片器模組門，如有必要，重置塗片器。
ASL－未灌注塗片模組	故障	未灌注塗片模組	運行灌注塗片器清洗周期並重置塗片器。如有必要，執行日常啓動。
ASL－塗片模組未準備就緒	故障	塗片模組問題	重置塗片器。請致電 Siemens 公司
ASL－塗片帶鬆弛	故障	塗片膜空、破碎或未正確穿好	執行塗片膜更換過程。確保檢查楔形塗片是否清潔。
ASL－染片機錯誤	故障	染片機錯誤	重置 Autoslide（請參見提示 2 和提示 3。）
ASL－塗片模組門打開	故障	塗片模組門打開	關閉染片機模組門。如有必要，執行機械初始化。
ASL－未抽吸染片機	故障	未灌注染片機	檢查消息日誌，查看是否已執行了日常啓動，執行日常啓動，或者在日常啓動已完成時執行染片機灌注，然後執行必要的機械初始化。
ASL－染片機未準備就緒	故障	染片機子系統未沖洗	重置 Autoslide
ASL－染片機浸在甲醇內	故障	染色池充滿甲醇	運行每日或每周啓動過程排放甲醇。
ASL－嚴重錯誤一停止	故障	染片機門打開如果設置了 Alarm/Stop（警報／停止）標準，運行停止。	關閉染片機門，重置 Autoslide，恢復運行。
ASL－染色廢液滿 ASL－染色廢液滿－停止	故障	染色廢液滿一染片機已啓用。	按照所在地法規要求處理廢液。必要時重置 Autoslide。
ASL－未知錯誤	故障	Autoslide 報告 ADVIA 2120/2120i 分析儀無法識別的錯誤	請致電 Siemens 公司
ASL－處於已預先塗片玻片模式	訊息	由於急診玻片模式當前生效，因此操作被拒絕。	等待急診玻片結束，關閉手工玻片輸入門，再試一次
ASL－Autoslide 吸取硬件不可用於自動進樣器	警告	自動進樣器硬件不可操作或不可用於第二個吸取位置。	如果系統有雙進樣器，執行自動進樣器重置如果重置不成功，將 ADVIA 2120/2120i 分析儀的電源關閉／打開請致電 Siemens 公司。

事件文本	嚴重性	可能原因	建議操作
ASL－Autoslide 不可用於製造玻片	警告	Autoslide 使用未就緒	按需要執行日常／每周維護，再試一次
ASL－請關閉手工門	警告	急診門打開	關閉手動／急診進氣門。
Autoslide 命令錯誤	警告	Autoslide 命令錯誤，或 EEPROM 故障	重試命令
Autoslide 日常關機未完成	警告	出現錯誤，導致無法執行 Autoslide 日常關機。	查看消息日誌查找錯誤，糾正所有問題，然後重試日常關機。如果仍不成功，執行機械初始化，然後重試日常關機。
Autoslide 日常啓動未完成	警告	出現錯誤，導致無法執行 Autoslide 日常關機。	查看消息日誌查找錯誤，糾正所有問題，然後重試日常關機。如果仍不成功，執行機械初始化，然後重試日常關機。
Autoslide 正在處理玻片	警告	在玻片處理過程中試圖轉到配置屏幕。	等到所有玻片處理完畢再嘗試更改配置。
Autoslide 手動進氣門無法打開	警告	由於染片機未啓用或 ADVIA 2120/2120i 自動進樣器處於活動狀態，手動進氣門無法打開。	在 Autoslide 操作菜單中啓用染片機，或者在適當的情況下停止自動進樣器，再試一次。
Autoslide 手動進氣門無法打開	警告	在試圖打開手動進氣門時出現錯誤。	檢查是否有物體堵塞了急診門，再試一次。
由於壓縮機未就緒，Autoslide 操作無法繼續	警告	儀器處於待機狀態，因此壓縮機是關閉的。	解除儀器的待機模式
Autoslide 拒絕執行命令	警告	Autoslide 在此時不能執行命令	操作取抉於當時情況。通常無需採取措施。
Autoslide 每周關機未完成	警告	在每周關機過程中出現錯誤。	檢查消息日誌中是否有其他錯誤，糾正問題，重置 Autoslide，並重複每周關機。
Autoslide 每周啓動未完成	警告	在每周啓動過程中出現錯誤。	檢查消息日誌中是否有其他錯誤，糾正問題，重置 Autoslide，並重複每周關機。
需要執行 Autoslide 每周啓動	警告	現在需要執行每周啓動。	執行每周啓動。

Autoslide 規格

Autoslide 只能在室內使用。不建議在海拔高於 2000 米（6000 英尺）處使用該儀器。

處理速度

最高每小時 108 片玻片

尺寸

重量：60 kg（約）

寬：91 cm

深：70 cm

高：50 cm

操作溫度範圍

20 – 30℃

相對濕度

30 - 60%

噪音等級

65 分貝

電源要求

100V 至 240V ± 10%

最高：200 VA

玻片要求

超光澤、圓角、磨砂邊

76 mm x 26 mm x 1 mm

只能使用 Siemens 指定供應商提供的玻片。

檢體要求

75 µL 全血

法律訊息

分析儀有限保修和服務交付政策 2

保修期 2
附加服務期 2
正常辦公時間內的服務 2
服務呼叫範圍 3
正常辦公時間以外的服務 3
更換部件 3
設計變更和分析儀改裝 3
指定主要操作者 3
OSHA 要求（僅限美國） 3

保修和服務排除條款 4

聯繫訊息 5

SIEMENS 公司授權代表 5

地址 5

- 本節提供下列訊息：
- Siemens 公司授權代表，即歐洲 Siemens 公司聯繫機構的地址
- 獲得服務和技術訊息以及訂購耗材的地址
- 分析儀保修和服務交付政策訊息

分析儀有限保修和服務交付政策

Siemens Healthcare Diagnostics Inc.及其授權代理商可根據具體協議或發票上載明的標準文本，爲購買新型 Siemens 分析儀的客戶提供有限保修。如果分析儀在保修期內因材料和／或工藝缺陷出現故障，客戶憑借有限保修將無需承擔因修理分析儀而發生的成本。

Siemens Healthcare Diagnostics Inc.可自行選擇爲客戶提供保修服務的方式，即到現場修理分析儀服務，或者根據下文中*《更換部件以及保修和服務》*中闡明的限制和排除條款，更換有缺陷的分析儀或組件。在保修期內或任何附加服務期限內修理、更換或替換分析儀或組件時，不會將保修期或服務期限延長到超過已商定的原期限。

當客戶要求提供服務時，Siemens 公司代表或授權代理商會就客戶的分析儀可享受的服務類型通知客戶，並說明應如何獲得相應服務。

保修期

有限保修期通常自在客戶所在地安裝完原始分析儀之日開始，期限爲該日期之後的 1 年，除非 Siemens Healthcare Diagnostics Inc.（或其授權代理商）與客戶雙方的全權代表已通過書面方式明確規定其他期限（銷售代表通常不是履行這些職責的 Siemens 公司授權代表）。

附加服務期

在一些例外情況下，客戶可以購買超出購買原始分析儀時附帶的所有原始保修期的附加服務，從而在原始安裝日期以後的第二年或之後若干年享受服務。客戶的原始購買發票或相關協議附錄中必須指明附加服務內容的期限（以月爲單位）。

正常辦公時間內的服務

在正常辦公時間內，客戶可以聯繫距離最近的 Siemens Healthcare Diagnostics Inc.辦公室或授權代理商。請參考本節中的 Siemens 公司地址列表。

服務呼叫範圍

保修或服務呼叫通常包括現場修理或更換分析儀或組件、出差到分析儀所在地以及正常辦公時間內維修人員的現場服務。客戶要獲得其所擁有分析儀的服務，只需按相關說明即可享受保修或服務呼叫。只要已通過修理或更換解決了任何材料或工藝缺陷，而且分析儀符合適用規範，即認爲已履行服務呼叫。在履行服務後，客戶會收到一份文件，其中詳細說明 Siemens HealthCare Diagnostics Inc.代表或授權代理商完成的工作。

正常辦公時間以外的服務

在某些例外情況下，客戶也可以聯繫距離最近的 Siemens Healthcare Diagnostics Inc. 辦公室或授權代理商，要求在正常辦公時間以外，包括夜間、周末或全國公眾假期提供服務或換貨。在正常辦公時間以外提供服務需要收費，除非客戶已訂購在所申請時間提供服務的服務產品選項。

更換部件

在履行服務的過程中，Siemens Healthcare Diagnostics Inc.或其授權代理商會提供適用部件修理分析儀，或者安排將分析儀或受影響零部件換貨，除被視爲客戶維修項目的某些零部件或裝置以外，不收取任何費用。客戶維修項目包括但不限於下列項目：燈、電極或傳感器（享受單獨的保修）、試劑、校正儀、控件、紙和筆。對於任何特定型號的分析儀，請參考相關系統操作者手冊，獲得完整的客戶維修項目列表。

設計變更和分析儀改裝

Siemens Healthcare Diagnostics Inc.保留隨時更改特定型號分析儀的設計或製造的權利，且不承擔將相關變更提供給每位客戶或應用於所有分析儀的任何責任。如果 Siemens 公司通知客戶某一項變更可提高分析儀的性能或可靠性，並且要求改裝相關分析儀，則在由 Siemens 公司承擔費用、且相應改裝或變更不會對分析儀性能特徵造成不良影響的前提下，客戶必須同意允許 Siemens 公司或授權代理商對組件進行改裝或進行設計變更。

指定主要操作者

每位客戶指定一名主要操作者，該操作者負責通過電話向 Siemens 公司代表描述分析儀故障，並按照指示執行簡單的調整和校正。如果未指定主要操作者或該人員在客戶申請服務時未在崗，則提供的服務可能延遲。

OSHA 要求（僅限美國）

如果需要在客戶所在地提供服務，客戶必須向 Siemens 公司代表提供符合美國勞工部的職業安全與衛生法(OSHA)（1970 年修訂）的足夠設施。

保修和服勞排除條款

以下排除條款用於補充所有書面保修或服務協議中的所有排除條款。

如果發生下列任何事件，則保修或服務條款不適用：

1. Siemens Healthcare Diagnostics Inc.授權代表以外的其他人員已對分析儀進行修理或修改。
2. 已經使用 Siemens 品牌附件以外的附件和耗材運行分析儀，或者耗材和／或試劑不具備系統操作者手冊中規定的相同等級、質量和成分。
3. Siemens Healthcare Diagnostics Inc.已通知客戶某一項變更可提高分析儀的性能或可靠性，客戶不同意改裝或對分析儀進行設計變更。
4. 客戶並非向 Siemens Healthcare Diagnostics Inc.或其授權代理商之一購買分析儀。
5. 除非已指定其他條款，在分析儀運達客戶設施所在地之後 90 天內尚未安裝分析儀。
6. 客戶未執行系統操作者手冊中說明的正確客戶維修規程。
7. 對分析儀的使用不當或將其用於設計用途以外的用途。
8. 分析儀在運輸到客戶所在地的過程中已損壞，或者客戶在未經 Siemens 公司代表監督的情況下移動或遷移分析儀時造成損壞。
9. 洪水、地震、龍卷風、颶風或者其他自然或人爲災害導致分析儀損壞。
10. 戰爭、蓄意破壞、怠工、縱火或騷亂導致分析儀損壞。
11. 電涌或電壓超過系統操作者手冊中說明的容差導致分析儀損壞。
12. 分析儀以外任何來源的水導致分析儀損壞。
13. 客戶已購買備用協議，其中的保修期或服務期條款取代這些條款。

對於因上述任何原因導致的損壞或故障。Siemens Healthcare Diagnostics Inc.或其授權代理商可以在修理分析儀之後，按照當前標準人工和零部件費用向客戶出具發票。

除以上內容中所闡明的保修外，對於向客戶銷售分析儀、向客戶租借分析儀或者在租借協議到期或終止後向客戶銷售分析儀時，不爲分析儀提供任何其他明示或暗示的保修。

SIEMENS Healthcare Diagnostics Inc.明確否認對適銷性或者針對特定用途的適用性的任何暗示祖保。在違反任何保修或服務協議時，SIEMENS Healthcare Diagnostics Inc.的責任僅限於修理或更換有缺陷的設備，對於所有性質的直接、間接、偶然、附帶或必然的任何損失，均不承擔任何責任。對於在修理或提供更換服務的過程中因任何原因造成的延誤，Siemens 公司均不承擔責任。

任何限制或者與特定轄區適用法律或特定書面協議不一致的其他條款均不適用於該轄區的客戶或者必須遵守這些協議。

技術支持訊息

請參考本附最中的規程，在呼叫技術支持時提供需要的系統訊息。

聯繫訊息

本節提供下列訊息：

- Siemens 公司授權代表，即歐洲的 Siemens 公司聯繫機構的地址
- 獲得服務和技術訊息以及訂購耗材的 Siemens 公司地址

Siemens 公司授權代表

Siemens Healthcare Diagnostics Ltd.

Sir William Siemens Sq., Frimley, Camberley, UK GU16 80D.

警告和安全訊息

警告 2

安全訊息 3

法規合規 3

標準或法規 3
CE 標記要求 3
噪音限制要求 3

文檔 4

系統符號標識 4

結果的解釋 9

交流電源盒上警告標籤的說明 9

手動閉管進樣器上警告標籤的說明 10

防止受到激光傷害 10

RBC 激光光學裝置 10
自動進樣器條碼閱讀器 11

警告



電氣警告

為避免在執行該過程時受到電擊和／或損壞儀器，請在繼續操作之前關閉分析儀的電源。



生物危害

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。佩戴面部防護裝置、戴手套並穿防護服。

對於與人或動物體液接觸的所有產品或物體，在進行清潔前後，應首先對其進行處理以防止傳播傳染病。應佩戴面部防護裝置、戴手套並穿防護服。操作者應按照相關建議進行操作，防止傳染性試劑在醫療機構內傳播，請參見美國臨床實驗室標準化研究所（前 NCCLS）的《Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline – Third Edition_ 2005 CLSI Document M29-A》 2005 CLSI Document M29 – A3》。本文檔包含有關用戶防護的全面訊息，可將其用作實驗室安全說明的參考材料。



激光的警告

為避免傷害眼睛，切勿直視激光光束或明亮表面反射的激光光束。必須嚴格遵循所有現場維修程序。只有經過 Siemens 公司培訓的現場維修人員可以執行與激光裝置相關的操作。

有關更詳細的安全訊息和激光規格，請參考安全訊息、防止受到激光傷害。



警告

在處理 EZ KLEEN 時，請穿防護服、戴手套並配帶安全眼鏡。吞食有害，並且可能導致眼睛和皮膚刺激。



警告

普通家用清潔漂白水是 5%的次氯酸鈉。超強家用清潔漂白水是 6%的次氯酸鈉。以上兩種漂白水均可用於 ADVIA 2120/2120i 血液分析儀。在使用作為清潔劑和消毒劑的漂白水時，請穿防護服、戴手套並配帶安全眼鏡。吞食有害，並且可能導致眼睛和皮膚刺激。

使用不含重金屬的家用漂白劑，如次氯酸鈉。

要製備 25%的家用漂白水溶液，請使用三份清潔的蒸餾水或去離子水稀釋一份漂白水。在室溫存儲條件下，製備的溶液可保存一周。

安全訊息

ADVIA 2120/2120i 分析儀中已集成了安全功能，旨在防止操作者受到人身傷害、分析儀被損壞以及測試結果不準確。

法規合規

標準或法規

ADVIA 2120/2120i 符合下列安全標準或法規：

EN61010-1: 1993	測量、控制和實驗室用電氣設備安全要求；第 1 部分
EN60825-1	激光產品安全性；第 1 部分
UL 3101-1	實驗室用電氣設備；第 1 部分：常規要求
CAN/CSA C22.2 NO.1010.1-92	測量、控制和實驗室用電氣設備安全要求；第 1 部分常規要求
CFR 47：第 1 章 FCC 子部分 B 第 15.103 部分豁免設備(C)第 15.105 (A) 部分	本設備已通過測試，符合 FCC 規則第 15 部分中對 A 類數字設備的限制。這些限制旨在對設備在商業環境中操作時的有害干擾提供合理保護。本設備會生成、使用並發射射頻能量，如果在其安裝和使用過程中不遵守說明手冊，可能會產生對無線電通信的有害干擾。在居民區中操作本設備可能會產生有害干擾，此時用戶應自行承擔相關費用，以消除這些干擾。

CE 標記要求

ADVIA 2120/2120i 符合以下標準。因此，本設備符合歐洲 IVDD 指令 98/79 EC 中有關“CE”標記的 EMC 符合性要求。

EN 613261 1997+ A1: 1998 + A2: 2001（"A”類）	測量、控制和實驗室用電氣設備安全要求一 EMC 要求

噪音限制要求

ADVIA 2120/2120i 符合以下噪音限制要求：

EN27779: 1989	計算機和辦公室設備發出的空氣傳播噪音的測定(61 dBA)

文檔

在書面和聯機文檔中，所有危害（與試劑有關的危害除外）的分類如下所示：

警告　指示如果不完全遵循操作規程和規範，則存在人身傷害或危及生命的危險。

警示　指示如果不嚴格遵循操作規程和規範，則存在損壞或破壞設備的可能性。

重要訊息　指示如果不完全遵循操作規程和規範，會對分析儀功能（包括測試結果）產生負面影響。

與存在、處理和使用所需試劑相關的危害的分類如下所示：

警示！　指示可能導致疾病、灼傷、皮膚過敏等危險。稀釋的酸、弱腐蝕性材料、產生輕微皮膚刺激的材料和易燃材料均屬於此類別。

注意　指示存在影響用戶或性能的特定風險。

請參考試劑容器上的標籤和材料安全數據表，了解有關與試劑相關的危險和預防措施的訊息。

系統符號標識

本節介紹 ADVIA 2120/2120i 分析儀機箱或分析儀包裝上出現的符號。分析儀上的符號說明某些組件的位置以及有關正確操作的警告。分析儀包裝上的符號說明其他重要訊息。



警告和警示

- 警告指示如果不完全遵循操作規程和規範，則存在人身傷害或危及生命的危險的。
- 警示指示如果未嚴格遵守操作規程或操作指示，則存在數據丟失或損壞、設備破坏的可能。



如果分析儀上帶有此符號但未給出其他訊息，則必須參考使用說明書。



生物危害

分析儀正面的生物危害警告標籤旨在警告您，在檢測過程中存在面對生物危害或通過分析儀傳染的可能性。



此符號標識此產品可能包含傳染性試劑。



此符號警告您存在可能有害的物質。



這些符號都用於警告您廢液可能存在生物危害。



激光危險



電氣危險



此符號指示試管內診斷設備或體外診斷醫療設備。



此符號提示您應當參考操作說明來獲得必要的訊息。

REF

此符號指示訂購部件或產品時的數量。

SN

此符號指示部件或產品的序列號。



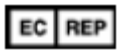
此符號指示產品的批號。



此符號指示產品廠商的名稱和所在地。



此符號指示產品的生產日期。



此符號指示廠商在歐洲地區的受權代表。



此符號指示產品符合歐盟的適用法規。



此符號指示產品的安全性已經 UL 批准（美國）



此符號指示產品的安全性已經 CSA 批准（加拿大）。



此符號指示光度計符合 DIN Deutsches Institute für Normung e.V 的 Working Committee on Photometers of the Standards Committee on Medicine (NAMed)所制定的 DIN 標準 58 960。



此符號指示產品屬於 1 關激光產品，在正常操作過程中不會產生激光照射。



此符號指示產品屬於 2 類激光產品，可能會受到激光光束的照射。



這是 On（開機）符號。



這是 Off（關機）符號。



這是 Start（啓動）符號。



這是 Standby（待機）符號。



此符號指示廢液容器的正常系統操作的開關位置。



此符號指示清空廢液容器時的開關位置。



此符號指示需要清空廢液容器。



此符號指示排放口的打開位置和關閉位置。



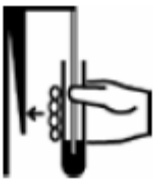
此符號指示液體廢料。



此符號指示壓力。在此示例中，該符號指示 20 PSI.



此符號指示真空。在此示例中，該符號指示 20" Hg 的真空。



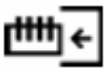
此符號指示手動開管進樣器。



此符號指示手動閉管進樣器。



此符號指示進樣器上有樣品架。



這是彈出樣品架符號。



這是網絡符號。



這是監視器符號。

此符號指示最高液面。

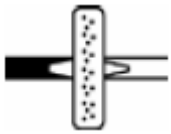


這是旋鈕符號。

這是保險絲符號。



這是過濾器符號。



這是通氣符號。



這是 CPU 符號。



此符號指示保護終端。



這是條碼掃描儀符號。



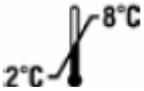
此符號指示移動組件會導致受傷。



此符號標識包含可循環利用材料的產品。



此符號指示包裝朝上。



此符號指示存儲產品時可接受的溫度範圍。



此符號標識產品的最晚使用日期。

使用期限

CAL — 這是 SETpoint 校正品符號。

CONTROL ABN 1 — 這是 TESTpoint 3-in-1 血液品管品異常 1 符號。

CONTROL ABN 2 — 這是 TESTpoint 3-in-1 血液品管品異常 2 符號。

CONTROL NORM — 這是 TESTpoint 3-in-1 血液品管品正常值符號。

CONTROL HIGH — 這是 TESTpoint 品管品高值符號。

CONTROL LOW — 這是 TESTpoint 品管品低值符號。

CONTROL NORM — 這是 TESTpoint 品管品正常值符號。

CONTROL CSF 1 — 這是 CSF 品管品 1 符號。

CONTROL CSF 2 — 這是 CSF 品管品 2 符號。

CONTROL RETIC HIGH — 這是 ADVIA RETIC 品管品高值符號。

CONTROL RETIC LOW — 這是 ADVIA RETIC 品管品低值符號。

DEFOAMER — 這是 DEFOAMER 符號。

EZ KLEEN — 這是 EZ KLEEN 符號。

BASO — 這是 BASO 試劑符號。

CSF REAGENT — 這是 CSF 試劑符號。

HGB — 這是 HGB 試劑符號。

CN-FREE HGB — 這是 CN-FREE HGB 試劑符號。

PEROX 1 — 這是 PEROX 1 試劑符號。

PEROX 2 — 這是 PEROX 2 試劑符號。

PEROX 3 — 這是 PEROX 3 試劑符號。

PEROX | SHEATH　這是 PEROX SHEATH 符號。

RBC/PLT　這是 RBC/PLT 試劑符號。

SHEATH/RINSE　這是 SHEATH/RINSE 符號。

結果的解釋

系統操作者和實驗室主管負責按照適用產品標籤（聯機文檔、包裝中的說明書、公告）上說明的規程操作和維護 Siemens 公司產品，並負責判斷產品性能是否符合相關說明。

如果在上述預先說明的操作和維護環境下，發生實驗室協議中定義的反常或異常結果，則實驗室人員應首先確定是否已按照產品標籤運行和操作系統；然後，根據實驗室協議，向臨床人員說明結果與實驗室規定的正常值不符。

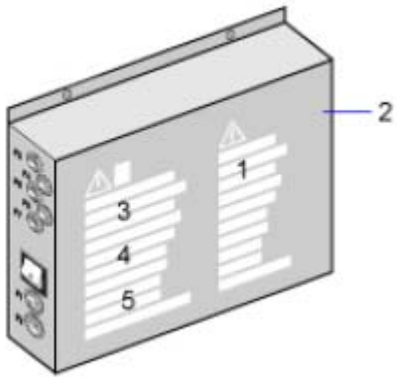
Siemens 公司產品不用於對患者進行診斷。Siemens 公司建議使用本公司的診斷產品（分析儀、試劑、軟體、硬件）收集數據，僅反映患者在特定時間的化學、血液學或免疫學狀態。在確定診斷結果和治療療程時，必須將上述數據與其他診斷訊息以及負責醫師對患者狀況的評估綜合考慮。

Siemens 公司診斷產品的任何故障（例如，不符合性能規格或不具備預期性能）均應當由實驗室人員通過正確方法解決。產品標籤上的各個部分中說明了各種故障及其可能對結果產生的影響。

交流電源盒上警告標籤的說明

1. 只能由符合資質人員打開交流電源盒。操作者只能維修交流電源盒中的保險絲 F1 到 F7，無需打開模組即可更換這些保險絲。

2. 交流電源盒一側的兩個電源插座僅用於分析儀附帶的計算機和顯示器。這些插座設計用於確保分析儀設備的正常運行，並保證分析儀可通過安全認證。不要將其他設備連接到過兩個插座。



交流電源盒位置

3. 即使在關閉電源開關後，分析儀中的某些組件也仍然帶電，所以在維修分析儀（例如，更換保險絲）之前必須拔下主電源。

4. 始終同時更換 F1 和 F2。燒斷一根保險絲的任何大電流都會導致另一根保險絲受損，進而縮短其使用壽命。

5. 務必使用相同類型和等級的保險絲更換。如果保險絲標籤缺失或不合格，請參考保險絲訊息表。務必選擇適合分析儀輸入電壓要求的保險絲。

手動閉管進樣器上警告標籤的說明

進樣器門



切勿將手指插入手動閉管進樣器定心環中。

手動閉管進樣器



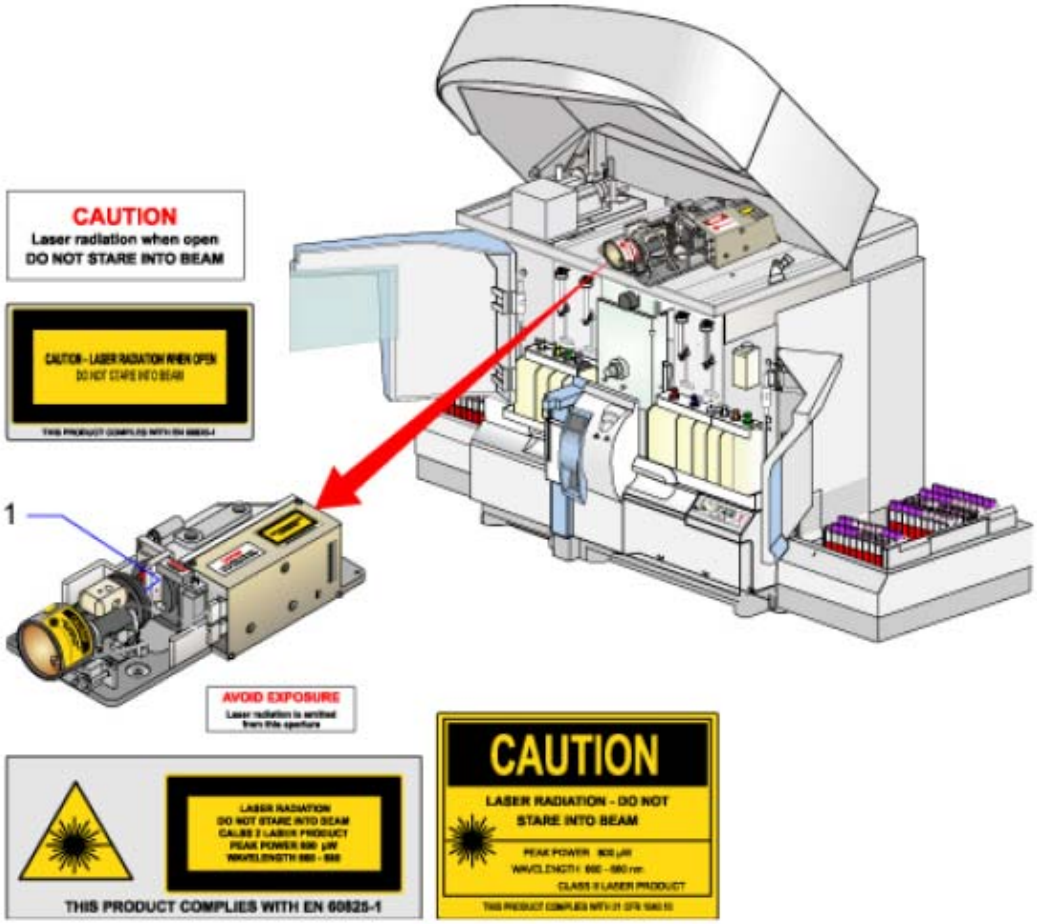
爲避免在取下或更換手動閉管進樣器針或定心環時受傷，必須將分析儀關閉。在取下定心環之後，必須立即爲針蓋蓋上保護蓋。

防止受到激光傷害

根據國家器械和輻射健康中心(CDRH)的 21 CFR 1040 法規和 EN-60825 的規定，ADVIA 2120/2120i 血液分析儀爲 I 類激光產品。

RBC 激光光學裝置

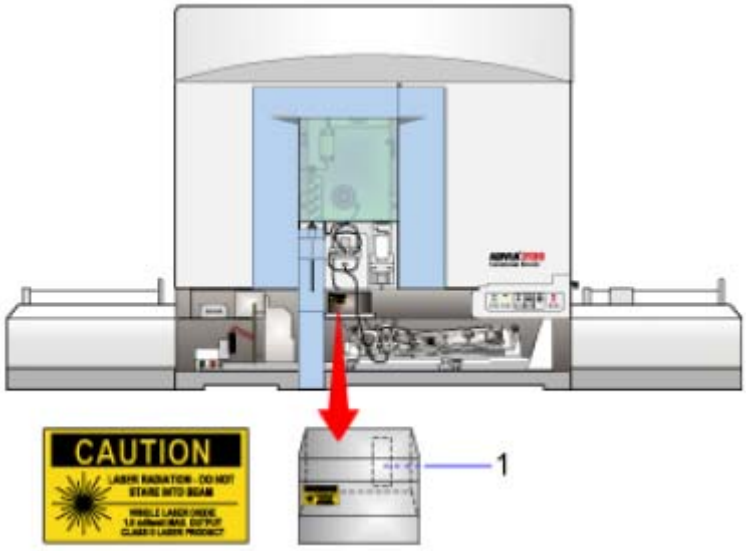
RBC 激光光學裝置爲 II 類激光設備，在波長爲 670 nm（正常值）且存在連續輸出波時，最大輸出功率爲 800 μW。RBC 激光裝置在內部設置爲最大輸出功率爲 290 ± 58 μW。激光光路位於一系列非互鎖保護外殼下，可防止人員在操作和維護激光產品過程中受到激光輻射。



1 激光孔

自動進樣器條碼閱讀器

自動進樣器條碼閱讀器爲 II 類激光設備。波長爲 670 nm，脈衝持續時間爲 90 ns 且光束發散角爲 3.6 mr 時，最大輸出功率爲 1 mw。



1 條碼閱讀器背面的激光光圈



激光的警告

部分現場維修過程需要取下用於防治人員受到激光輻射的保護外殼。必須嚴格遵守所有現場維修規程，以防止因激光輻射造成眼睛受傷。只有經過 Siemens 公司培訓的現場維修人員能夠執行與 ADVIA 2120/2120i 激光裝置相關的過程。

激光危害預防措施

維修 ADVIA 2120/2120i 激光光學器件時，必須按照下面的預防措施列表進行操作：

- 摘下手和手腕上佩戴的所有珠寶。
- 不要直視激光光束。
- 不要注視激光光束的特定反射光。
- 不要在光路上放置可反射光的物體，如螺絲刀或珠寶。
- 始終確保激光光束會被光擋截斷。

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